

**National Oceanic and Atmospheric Administration
National Marine Fisheries Service (NMFS)
Endangered Species Act (ESA) Section 7 Consultation
Biological Opinion and Magnuson-Stevens Act Essential Fish Habitat Consultation**

Action Agency: U.S. Bureau of Indian Affairs

Species/ESUs Affected: Snake River spring/summer chinook (*Oncorhynchus tshawytscha*)

Activities

Considered: Conduct of fisheries in the South Fork Salmon River, as described in the two separate Biological Assessments submitted by the Bureau of Indian Affairs on behalf of the Nez Perce Tribe and the Shoshone-Bannock Tribes, and in the State of Idaho's section 10 permit 1233.

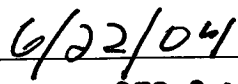
Consultation The Sustainable Fisheries Division, Northwest Region,
Conducted by: NMFS Consultation Number: 2004/00629

The Parties propose to conduct fisheries in the South Fork Salmon River consisting of Tribal ceremonial and subsistence (C&S) fisheries and non-Indian recreational fisheries directed at adult summer chinook salmon. The Bureau of Indian Affairs submitted biological assessments on behalf of the Shoshone-Bannock Tribes on May 11, 2004 (Calica 2004), and on behalf of the Nez Perce Tribe on May 18, 2004 (LaPointe 2004). Both biological assessments (hereafter referred to as the "BAs") were submitted to NMFS for the purpose of a section 7 consultation under the Endangered Species Act (ESA). The NMFS has determined that the proposed fisheries are likely to jeopardize the continued existence of Snake River spring/summer chinook salmon listed under the ESA. This determination is based on impacts on spring/summer chinook salmon resulting from the combination of proposed fisheries in the South Fork Salmon River. Management measures implemented through the Reasonable and Prudent Alternative limit the take of listed fish destined for the Poverty Flats and Stolle Meadows index areas and are expected to be sufficient to avoid jeopardizing the listed species.

Approved by:


D. Robert Lohn, Regional Administrator

Date:


[Expires on: **SEP 30 2004**]

Endangered Species Act - Section 7 Consultation and
Magnuson-Stevens Act Essential Fish Habitat Consultation

BIOLOGICAL OPINION AND
INCIDENTAL TAKE STATEMENT

Effects of South Fork Salmon River Tribal Fisheries in 2004
on Salmonids Listed Under the Endangered Species Act

Action Agencies: Bureau of Indian Affairs

Consultation Conducted by
National Marine Fisheries Service
Sustainable Fisheries Division

Date Issued: JUN 22 2004

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CONSULTATION HISTORY

Fisheries in the Snake River basin were managed under the Columbia River Fish Management Plan (CRFMP) and two subsequent interim agreements of the parties to U.S. v. Oregon from 1988 through July of 1999 when the agreements expired. The CRFMP was a consent decree adopted by the federal court in the case of U.S. v. Oregon. NOAA's National Marine Fisheries Service (NMFS) has provided consultation under section 7 of the ESA on proposed fisheries in the Snake River basin since 1992 when Snake River sockeye, spring/summer chinook and fall chinook salmon were first listed under the ESA. While the CRFMP was in effect, the Technical Advisory Committee (TAC) of U.S. v. Oregon generally prepared BAs for proposed Tribal and state fisheries which were submitted to NMFS by the U.S. Fish and Wildlife Service (USFWS). The TAC BAs considered treaty Indian and non-Indian fisheries within the jurisdiction of the CRFMP, with the exception of Idaho State fisheries in the Snake River basin which were considered separately under section 10 of the ESA. Since expiration of the CRFMP until 2001, the TAC continued to submit BAs to NMFS for fisheries proposed by the Parties, for section 7 consultation. In 2002, 2003, and 2004, the Bureau of Indian Affairs submitted BAs on behalf of the Nez Perce Tribe and the Shoshone-Bannock Tribes while the state of Idaho continues to apply for ESA take exemptions through section 10.

- The first consultation regarding Snake River basin fisheries occurred in 1992. The Shoshone-Bannock Tribes submitted a BA for their fisheries through the U.S. Bureau of Indian Affairs, Fort Hall Agency (BIA 1992). NMFS concluded that these fisheries were not likely to jeopardize the continued existence of Snake River sockeye salmon, spring/summer chinook, or fall chinook salmon.
- In 1993-1998, Snake River biological opinions were expanded to address all fisheries, except those of Idaho, conducted by the parties to U.S. v. Oregon. In 1993 and 1994, NMFS issued biological opinions determining that these fisheries were not likely to jeopardize the existence of listed Snake River spring/summer chinook, Snake River fall chinook, or Snake River sockeye salmon (NMFS 1993a; NMFS 1993b; NMFS 1993c; NMFS 1994a; NMFS 1994b).
- In 1995 and 1996, NMFS issued jeopardy biological opinions with reasonable and prudent alternatives describing modified fisheries in the Pahsimeroi River, East Fork Salmon River, Yankee Fork, and the mainstem Salmon River from Sawtooth Hatchery to the Pahsimeroi River (NMFS 1995a; NMFS 1996a).
- In 1997, NMFS issued a jeopardy biological opinion for Snake Basin fisheries with a reasonable and prudent alternative describing a level of take of Snake River spring/summer chinook salmon in the South Fork Salmon River area consistent with the conservation needs of the listed fish (NMFS 1997).
- In 1998, the NMFS issued a jeopardy biological opinion (NMFS 1998a), with a reasonable and prudent alternative describing modified fisheries in the upper Salmon River mainstem and the Pahsimeroi River.

- In 1999, NMFS issued a jeopardy biological opinion (NMFS 1999a), with a reasonable and prudent alternative describing modified fisheries in the upper Salmon River mainstem and the Pahsimeroi River.
- In 2000 and 2001, NMFS issued jeopardy biological opinions (NMFS 2000a, NMFS 2001a), with reasonable and prudent alternatives describing modified fisheries in the South Fork Salmon River.
- In 2002, NMFS concluded that the proposed fisheries were not likely to jeopardize the continued existence of Snake River sockeye salmon, Snake River spring/summer chinook, or Snake River fall chinook salmon Evolutionarily Significant Units (NMFS 2002).
- In 2003 NMFS only consulted on the South Fork Salmon River fisheries, which start after mid-June, and issued a jeopardy biological opinion (NMFS 2003), with reasonable and prudent alternatives describing modified fisheries in the South Fork Salmon River.

In 2004, the BIA submitted BAs on behalf of the Shoshone-Bannock Tribes and the Nez Perce Tribe on May 11, 2004 and May 18, 2004, respectively (LaPointe 2004 and Calica 2004). Some of the fisheries described in the BAs were scheduled to start in late April or early May, thus providing insufficient time for the section 7 review. NMFS wrote the BIA on June 8, 2004 indicating that they would complete consultation only on those fisheries starting on or after mid-June, in order to have time to complete consultation (Dygert 2004).

BIOLOGICAL OPINION

1.0 DESCRIPTION OF THE PROPOSED ACTION

1.1 Proposed Action

The treaty Indian fishery proposals contained in the above referenced BAs are based on the Tribes' treaty fishing rights reserved in the Treaties between the United States and the Tribes. The BIA, acting in its fiduciary role on behalf of the Tribes, seeks these ESA consultations on the basis of the United States' status as plaintiff in U.S. v. Oregon, as well as the federal government's trust responsibility to the Tribes.

The Shoshone-Bannock Tribes and the Nez Perce Tribe propose to conduct a suite of fisheries described in the BAs submitted on their behalf by the BIA (LaPointe 2004 and Calica 2004). However, due to the timing of their proposed fisheries and the date their respective BAs were submitted, the action considered in this Opinion is limited to only their respective South Fork Salmon River fisheries. The South Fork Salmon River fisheries will have impacts on ESA-listed fish, particularly Snake River spring/summer chinook salmon ESU.

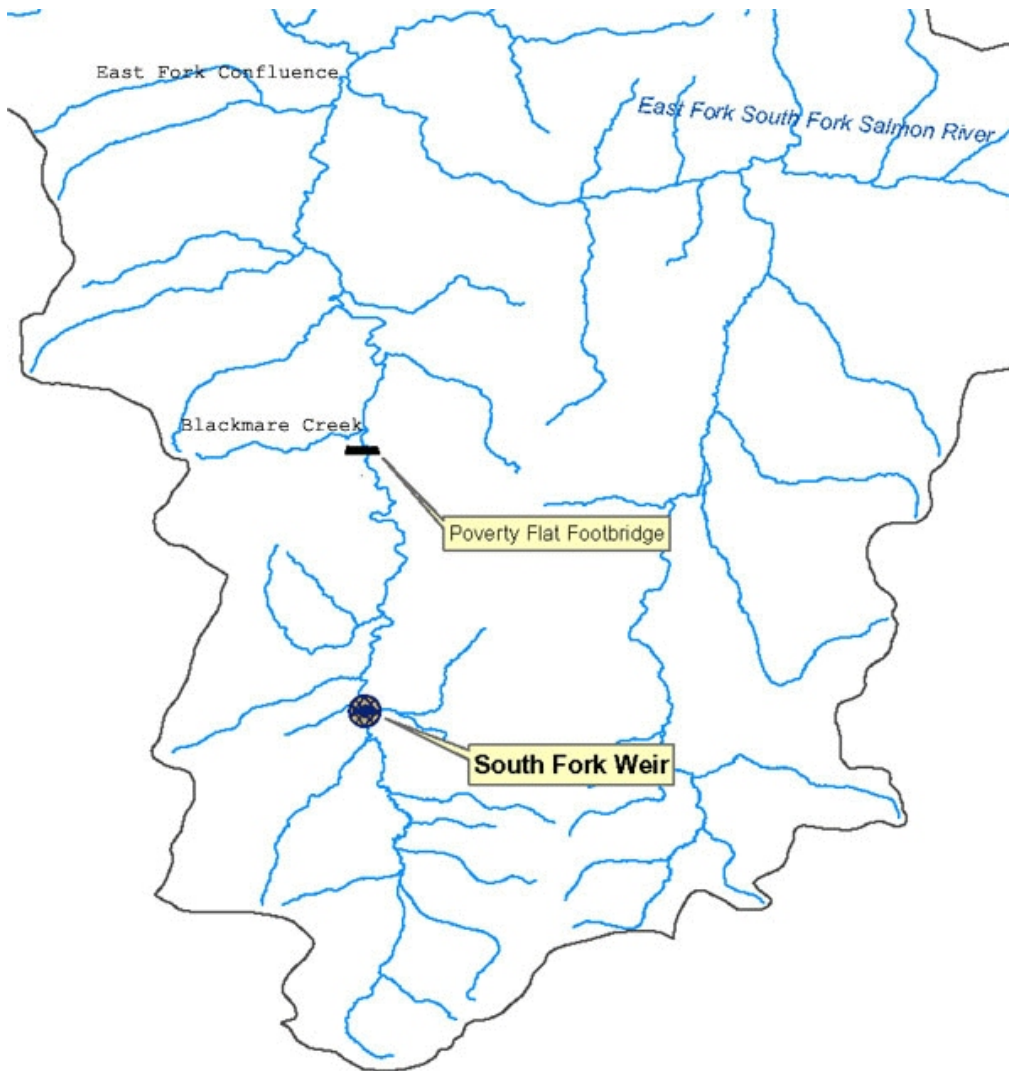


Figure 1. South Fork Salmon River Action Area

1.2 Action Area

For purposes of this Opinion, the action area encompasses the South Fork Salmon River, from the confluence of the East Fork South Fork Salmon River to the South Fork Salmon River weir (Figure 1).

1.3 Fisheries Proposed but not Considered

NMFS received the 2004 proposals in mid-May for fisheries scheduled to begin in early May. In the past, after receiving these late proposals, we have done our best to complete our consultation as quickly as possible. However, this has been unsatisfactory in that it has not provided for timely exemption of incidental take, or time for resolving reoccurring problems and conflicts between competing fisheries. As a result, similarly to what occurred in 2003, NMFS will not consult on proposed fisheries that have already started or are likely to start prior to mid-June when we can reasonably expect to complete what would still be an expedited review in 2004.

As we have done in the past, the tribes' proposed fisheries that we are able to review will be considered in a single biological opinion. Fisheries proposed by the state of Idaho are considered through the section 10 process, but also need to be considered in the biological opinion to ensure that the impacts from all proposed fisheries are accounted for. For the Shoshone-Bannock Tribes we will not consult on the Rapid River fishery which is scheduled to start in early May. The Shoshone-Bannock's biological assessment also briefly describes a steelhead fishery for the Salmon River Basin. The steelhead fishery will also not be considered because insufficient information was provided about the fishery. The Nez Perce Tribe proposed early season fisheries in the mainstem Snake River, Rapid River, and Lookingglass Creek. These fisheries will not be considered. The Nez Perce also proposed several fisheries in the Clearwater River subbasin. We have consulted on the Clearwater fisheries in the past and repeatedly concluded that there would be no adverse impacts to listed salmon or steelhead associated with these fisheries. There is no new information that would alter our conclusion for 2004. As a result, we conclude that further formal consultation on the spring season Clearwater fisheries described in the Nez Perce Tribe's BA is unnecessary.

1.4 Description of Fisheries Considered in this Consultation

The proposed Tribal fisheries in the South Fork Salmon River would occur above the confluence with East Fork South Fork Salmon River. Therefore fish returning to the Secesh River, East Fork South Fork River, and Johnson Creek are not likely to be affected by the proposed fisheries. There are two main areas in which the Tribes propose fishing: the Poverty Flats Area, and in the section of river between Poverty Flats and the South Fork Salmon River weir. These areas are managed separately, each with a separate escapement goal and harvest rate schedule.

1.4.1 Shoshone-Bannock Fishery for South Fork Salmon River Spring/Summer Chinook

The Shoshone-Bannock Tribes propose to harvest 4,176 chinook (including 3,991 unlisted hatchery fish and 185 listed fish (147 listed fish above Blackmare Creek and 38 listed fish below Blackmare Creek)) in the hatchery-influenced area (between the weir and East Fork South Fork). The proposed limit for Poverty Flats area in 2004 is 38 listed fish. The location of the Shoshone-Bannock Tribal spring/summer chinook fishery in the South Fork Salmon River will be from the hatchery weir to the confluence with the East Fork South Fork Salmon River (river mile (RM) 46).

The Shoshone-Bannock Tribes fisheries will be curtailed once the harvest guidelines for total fish, listed fish, or listed fish below Blackmare Creek in the South Fork Salmon River fishery areas are reached, or when salmon are observed spawning (until the spawning is completed), whichever of the four triggers occurs first. Because of the listed fish trigger, the worst-case is intended to not cause more than 185 listed fish to be harvested within this fishery area, of which no more than 38 will be taken in the Poverty Flats. Gear includes the traditional spear with no more than two hooks, hook-and-line, and basket traps and weirs constructed from willows. The Shoshone-Bannock Tribes do not employ selective gear that allow the live release of captured fish. Selectivity is provided through area and time restrictions.

Shoshone-Bannock Tribal harvest monitoring has occurred each year and will continue for 2004. Recent fisheries in the South Fork Salmon River have been conducted from early July through mid-August. The Shoshone-Bannock Tribes expect the fishery to occur between mid-June and August 22, 2004. The curtailment date corresponds with the Shoshone-Bannock Tribes' intent that this fishery will target hatchery fish returning to hatchery release areas. Therefore, the fisheries will be conducted while chinook are still actively migrating to the hatchery release areas.

1.4.2 Nez Perce Fishery for South Fork Salmon River Spring/Summer Chinook

The Nez Perce Tribe propose to harvest of 5,584 marked and unmarked hatchery chinook (the unmarked fish expected to be hatchery fish that were inadequately clipped) predicted to return to the weir in 2004. The fishery as proposed would also be expected to take a total of 133 listed natural-origin and/or listed hatchery-origin chinook in the South Fork Salmon River. Areas open to fishing would include the South Fork Salmon River from 10 feet below the weir (RM 72) downstream to the confluence with the East Fork South Fork. The fishery will be during June through August. Final season structure will be set by field regulations of the Nez Perce Tribe. Fishing gear permitted will initially include all traditional gear (gaff, dipnet, hoopnet, longbow, spear, and hook and line). Fishing will be curtailed when the harvest of 5,584 marked hatchery chinook or 133 listed fish wild/natural and/or listed hatchery chinook are reached.

1.4.3 The Idaho State-Managed Recreational Fishery for South Fork Salmon River Spring/Summer Chinook

Idaho recreational fisheries in the Snake River basin, including the South Fork Salmon River fishery, are being considered pursuant to a new section 10(a)(1)(B) permit application. In the meantime, permit 1233, which expires December 31, 2004, authorizes take associated with Idaho fisheries. Although non-Indian fisheries are not subject to this consultation, impacts associated with the Idaho's South Fork Salmon River fishery are considered, in addition to proposed fisheries, as necessary and appropriate. The Idaho Department of Fish and Game (IDFG) propose to harvest 3,909 unlisted surplus hatchery fish with an associated take of 94 listed fish

2.0 STATUS OF SPECIES UNDER THE ENVIRONMENTAL BASELINE

To determine a species' status under extant conditions (usually termed "the environmental baseline"), it is necessary to ascertain the degree to which the species' biological requirements are being met at that time and in that action area. For the purposes of this consultation, Snake River spring/summer chinook biological requirements are expressed in two ways: Population parameters such as fish numbers, distribution, and trends throughout the action area; and the condition of various essential habitat features such as water quality, stream substrates, and food availability. Clearly, these two types of information are interrelated. That is, the condition of a given habitat has a large impact on the number of fish it can support. Nonetheless, it is useful to separate the species' biological requirements into these parameters because doing so provides a more complete picture of all the factors affecting Snake River spring/summer chinook salmon survival. Therefore, the discussion to follow will be divided into two parts: Species Distribution and Trends; and Factors Affecting the Environmental Baseline.

In its review of population status and the effects of the proposed action on the Snake River spring/summer chinook salmon ESU, NMFS is using developing science from several sources including the Cumulative Risk Initiative (CRI) and Viable Salmonid Populations (VSP) paper. Each of these are described briefly below to provide the concept prior to their application in the subsequent ESU specific status discussion. NOAA Fisheries also recently reviewed the status of all currently listed salmon and steelhead ESUs as part of a review of their listing status. NOAA Fisheries findings were summarized in a recent Federal Register Notice regarding the proposed listings (June 14, 2004, 69 FR 33102). The findings related to the Snake River Spring/Summer Chinook ESU are also summarized below.

Cumulative Risk Initiative

To determine the conservation status of the listed ESUs, NMFS relies in part on the evolving scientific analysis contained in the CRI, which is an ongoing effort of the Northwest Fisheries Science Center (NWFSC 2000; NMFS 2000b). The CRI is designed to provide a standardized assessment of extinction risks and the magnitude of improvements required to mitigate these risks. The CRI provides an analytical structure that begins to allow evaluation of the potential effects of management actions aimed at different life stages or sources of mortality. In general, the CRI therefore provides a tool to assess the degree to which survival improvements in a particular sector can be combined with expected improvements in other sectors to provide the necessary overall improvements required for survival and recovery. The CRI analysis was used extensively in the Federal Columbia River Power System (FCRPS) biological opinion (NMFS 2000b) to help resolve critical questions regarding the magnitude of required survival improvements and how those survival improvements may be allocated among the various H's including harvest.

The CRI constructs population models for each species and assesses the risk of extinction for populations and/or for ESUs (depending on the data available). To assess the risk of extinction,

the CRI examines the population growth rate from 1980 through the most recent returns, and the year-to-year variability of the population's productivity.

For both entire ESUs and individual index stocks, the CRI estimates the average annual rate of population change, or "lambda." Lambda, which incorporates year-to-year variability, is the best summary statistic of how rapidly a population is growing or shrinking. A lambda less than 1.0 means the population is declining; a lambda greater than 1.0 means the population is increasing.

By combining lambda with estimates of environmental variability it is possible to calculate "extinction risk metrics." The CRI assesses the risk of *absolute* extinction, that is, one or no fish for five consecutive years. The analysis also reports the risk of 90% decline in abundance. All extinction metrics are calculated on 24- and 100-year time frames. For index stocks, where the data represent entire population counts, extinction risks are expressed in terms of the probability of an adult population falling to only one spawner. For ESUs, we calculate extinction metrics as the probability of a 90% decline after 24 years and after 100 years, because it is unlikely that entire ESUs have been accurately counted.

The models use survival for each life-stage, which allows a closer examination of the impacts of the various H's (Hydro, Habitat, Hatcheries, and Harvest) on population growth and on corresponding extinction risk. The models can help identify the life stages at which changes in survival will yield the largest impact on population growth rates. By running numerical experiments, the modelers can help put in perspective the impact of a particular activity, such as harvest, on the likelihood of extinction for a given population or ESU.

The CRI models project risks of extinction *if all factors remain the same as they were from 1980-99*. NMFS recognizes that many actions have been taken to improve the survival of these ESUs since 1999, and also recognizes that the base period arguably represents a particularly bad time for ocean survival of most ESUs. In the All-H paper and the FCRPS biological opinion, NMFS has taken into account the management improvements that have been made, as well as the potential benefits from improved ocean conditions of the past few years.

Because the ESA is directed at the conservation of naturally reproducing species and their habitats, NMFS uses the CRI models to determine the risk of extinction of the naturally spawning populations and ESUs. A major source of uncertainty in these analyses is whether and to what extent hatchery-spawned fish contribute to the next generation (certain assumptions must therefore be made about the spawning success of these adults). The uncertainties related to hatchery fish greatly affect estimates of productivity and in turn estimates of extinction risk and the magnitude of survival improvements that may be required. Low and high estimates of lambda were therefore reported based on the assumptions that hatchery-origin fish either contribute nothing to natural production or are equally successful as the natural-origin spawners. The relative productivity of hatchery fish almost certainly falls between the "all or nothing" assumptions and varies between populations.

Estimates of median population growth rate, risk of extinction, and the likelihood of meeting recovery goals are based on population trends observed during a base period that varies between subbasin populations. Population trends are projected under the assumption that all conditions will stay the same into the future.

Viable Salmonid Population

Another approach used for assessing the status of an ESU and its component populations is described in a paper related to Viable Salmonid Populations (McElhany et al. 2000). This paper provides guidance for determining the conservation status of populations and ESUs that can be used in ESA-related processes. In this opinion, we rely on VSP guidance in describing the population or stock structure of each ESU and the related effects of the action.

A population is defined in the VSP paper as a group of fish of the same species spawning in a particular lake or stream (or portion thereof) at a particular season which to a substantial degree do not interbreed with fish from any other group spawning in a different place or in the same place at a different season. Because populations as defined here are relatively isolated, it is biologically meaningful to evaluate the risk of extinction of one population independently from any other. Some ESUs may have only one population while others will have many.

The task of identifying populations within an ESU will require making judgments based on the available information. Information regarding the geography, ecology, and genetics of the ESU are relevant to this determination. This is a task that will generally be taken up as part of the recovery planning process. Recovery planning has just recently gotten underway in the Columbia River Basin. As a result, specific guidance on population structure is not yet available for most ESUs, although NMFS has recently provided interim guidance regarding geographic spawning aggregations abundance targets (Lohn 2002). It is nonetheless appropriate in the opinion to consider the potential diversity of each ESU and the status of each of the component stocks.

The VSP paper also provides guidance regarding parameters that can be used for evaluating population status including abundance, productivity, spatial structure, and diversity. In this opinion, we consider particularly the guidance related to abundance. The paper provides several rules of thumb that are intended to serve as guidelines for setting population specific thresholds (McElhany et al. 2000). The guidance relates to defining both "viable" populations levels and "critical" abundance levels. Although there are still no specific recommendations regarding threshold abundance levels for the Snake River spring/summer chinook ESU, interim abundance targets have been provided (Lohn 2002). These are discussed in this opinion and are used for evaluating population status and the related effects of the action.

2.1 Chinook Salmon

Chinook salmon (*Oncorhynchus tshawytscha* Walbaum), also commonly referred to as king, spring, quinnat, Sacramento, California, or tyee salmon, is the largest of the Pacific salmon (Myers et al. 1998). The species historically ranged from the Ventura River in California to Point Hope, Alaska in North America, and in northeastern Asia from Hokkaido, Japan, to the Anadyr River in Russia (Healey 1991). Additionally, chinook salmon have been reported in the Mackenzie River area of Northern Canada (McPhail and Lindsey 1970). Chinook salmon exhibit very diverse and complex life-history strategies. Healey (1986) described 16 age categories for chinook salmon, seven total ages with three possible freshwater ages. This level of complexity is roughly comparable to sockeye salmon (*O. nerka*), although sockeye salmon have a more extended freshwater residence period and utilize different freshwater habitats (Miller and Brannon 1982, Burgner 1991). Two generalized freshwater life-history types were initially described by Gilbert (1912): “stream-type” chinook salmon reside in freshwater for a year or more following emergence, whereas “ocean-type” chinook salmon migrate to the ocean predominately within their first year. Healey (1983, 1991) has promoted the use of broader definitions for “ocean-type” and “stream-type” to describe two distinct races of chinook salmon. This racial approach incorporates life-history traits, geographic distribution, and genetic differentiation and provides a valuable frame of reference for comparisons of chinook salmon populations. For this reason, the BRT has adopted the broader “racial” definitions of ocean- and stream-type for this review.

Of the two life-history types, ocean-type chinook salmon exhibit the most varied and plastic life-history trajectories. Ocean-type chinook salmon juveniles emigrate to the ocean as fry, subyearling juveniles (during their first spring or fall), or as yearling juveniles (during their second spring), depending on environmental conditions. Ocean-type chinook salmon also undertake distinct, coastally oriented, ocean migrations. The timing of the return to freshwater and spawning is closely related to the ecological characteristics of a population’s spawning habitat. Five different run times are expressed by different ocean-type chinook salmon populations: spring, summer, fall, late-fall, and winter. In general, early run times (spring and summer) are exhibited by populations that use high spring flows to access headwater or interior regions. Ocean-type populations within a basin that express different runs times appear to have evolved from a common source population. Stream-type populations appear to be nearly obligate yearling outmigrants (some 2-year-old smolts have been identified), they undertake extensive off-shore ocean migrations, and generally return to freshwater as spring-run- or summer-run fish. Stream-type populations are found in northern British Columbia and Alaska, and in the headwater regions of the Fraser River and Columbia River interior tributaries.

Prior to development of the ESU policy (Waples 1991), the NMFS recognized Sacramento River winter-run chinook salmon as a “distinct population segment” under the ESA (NMFS 1987). Subsequently, in reviewing the biological and ecological information concerning West Coast chinook salmon, Biological Review Teams (BRTs) have identified additional ESUs for chinook salmon from Washington, Oregon, and California: Snake River fall-run (Waples et al. 1991),

Snake River spring- and summer-run (Matthews and Waples 1991), and Upper Columbia River summer-run- and fall-run chinook salmon (originally designated as the mid-Columbia River summer-run- and fall-run chinook salmon, Waknitz et al. 1995), Puget Sound chinook salmon, Washington Coast chinook salmon, Lower Columbia River chinook salmon, Upper Willamette River chinook salmon, Middle Columbia River spring-run chinook salmon, Upper Columbia River spring-run chinook salmon, Oregon Coast chinook salmon, Upper Klamath and Trinity rivers chinook salmon, Central Valley fall-run and late-fall-run chinook salmon, and Central Valley spring-run chinook salmon (Myers et al. 1998), the Southern Oregon and Northern California chinook salmon, California Coastal chinook salmon, and Deschutes River (NMFS 1999).

Of the 17 chinook salmon ESUs identified by the NMFS, eight are not listed under the United States ESA, seven are listed as threatened (Snake River spring- and summer-run chinook salmon, and Snake River fall-run chinook salmon [April 22, 1992, 57 FR 14653]; Puget Sound chinook salmon, Lower Columbia River chinook salmon, and Upper Willamette River chinook salmon [March 24, 1999, 64 FR 14308]; Central Valley fall-run, and California Coastal chinook salmon [September 16, 1999, 64 FR 5039], and two are listed as endangered (Sacramento River winter-run chinook salmon [January 4, 1994, 59 FR 440], and Upper Columbia River spring-run chinook salmon [March 24, 1999, 64 FR 14308]).

The listed species of concern for this opinion is Snake River Spring/Summer Chinook salmon ESU. The 1991 ESA status review (Mathews and Waples 1991) of the Snake River spring/summer-run chinook salmon ESU concluded that the ESU was at risk based on a set of key factors. Aggregate abundance of naturally produced Snake River spring/summer-run chinook salmon runs had dropped to a small fraction of historical levels. Short-term projections (including jack counts, habitat/flow conditions in the broodyears producing the next generation of returns) were for a continued downward trend in abundance. Risk modeling indicated that if the historical trend in abundance continued, the ESU as a whole was at risk of extinction within 100 years. The review identified related concerns at the population level within the ESU. Given the large number of potential production areas in the Snake River basin and the low levels of annual abundance, risks to individual subpopulations may be greater than the extinction risk for the ESU as a whole. The 1998 chinook salmon status review (Myers et al. 1998) summarized and updated these concerns. Both short and long-term abundance trends had continued downward. The report identified continuing disruption due to the impact of mainstem hydroelectric development including altered flow regimes and impacts on estuarine habitats. The 1998 review also identified regional habitat degradation and risks associated with the use of outside hatchery stocks in particular areas—specifically including major sections of the Grande Ronde River basin.

The NMFS convened a BRT to update the status of listed chinook salmon ESUs in Washington, Oregon, California, and Idaho. The chinook salmon BRT¹ met in January, March, and April of 2003 in Seattle, Washington, to review updated information on each listed chinook ESU, including the Snake River Spring/Summer Chinook ESU that is the subject of this biological opinion.

2.1.1 Snake River Spring/Summer Chinook Salmon ESU

2.1.1.1 Life History

Spring and summer chinook salmon runs returning to the major tributaries of the Snake River were classified as an evolutionarily significant unit (ESU) by NMFS (Matthews and Waples 1991). This ESU includes production areas that are characterized by spring-timed returns, summer-timed returns, and combinations from the two adult timing patterns. Runs classified as spring chinook salmon are counted at Bonneville Dam beginning in early March and ending the first week of June; runs classified as summer-run chinook salmon return to the Columbia River from June through August. Returning fish hold in deep mainstem and tributary pools until late summer, when they emigrate up into tributary areas and spawn. In general, spring-run type chinook salmon tend to spawn in higher elevation reaches of major Snake River tributaries in mid- through late August, and summer-run Snake River chinook salmon spawn approximately 1 month later than spring-run fish.

Many of the Snake River tributaries used by spring and summer chinook salmon runs exhibit two major features: extensive meanders through high elevation meadowlands and relatively steep lower sections joining the drainages to the mainstem Salmon (Matthews and Waples 1991). The combination of relatively high summer temperatures and the upland meadow habitat creates the potential for high juvenile salmonid productivity. Historically, the Salmon River system may have supported more than 40% of the total return of spring-run and summerrun chinook salmon to the Columbia River system (e.g., Fulton 1968).

The Snake River spring/summer-run chinook salmon ESU includes current runs to the Tucannon River, the Grand Ronde River system, the Imnaha River, and the Salmon River (Matthews and Waples 1991). The Salmon River system contains a range of habitats used by spring/summer-run chinook salmon. The South Fork and Middle Fork tributaries to the Salmon River currently support the bulk of natural production in the drainage. Two large tributaries entering above the confluence of the Middle Fork, the Lemhi and Pahsimeroi Rivers, drain broad alluvial valleys

¹The Biological Review Team (BRT) for the updated chinook salmon status review included, from the NMFS Northwest Fisheries Science Center: Thomas Cooney, Dr. Robert Iwamoto, Dr. Robert Kope, Gene Matthews, Dr. Paul McElhaney, Dr. James Myers, Dr. Mary Ruckelshaus, Dr. Thomas Wainwright, Dr. Robin Waples, and Dr. John Williams; from the NMFS Southwest Fisheries Science Center: Dr. Peter Adams, Dr. Eric Bjorkstedt, and Dr. Steve Lindley; from the NMFS Alaska Fisheries Science Center (Auke Bay Laboratory): Alex Wertheimer; and from the USGS Biological Resource Division: Dr. Reginald Reisenbichler.

and are believed to have historically supported substantial, relatively productive anadromous fish runs. Returns into the upper Salmon River tributaries have re-established following the opening of passage around Sunbeam Dam on the mainstem Salmon River downstream of Stanley, Idaho. Sunbeam Dam in the Upper Salmon River was a serious impediment to migration of anadromous fish and may have been a complete block in at least some years before its partial removal in 1934 (Waples et al. 1991).

Current runs returning to the Clearwater River drainages were not included in the Snake River spring/summer-run chinook salmon ESU. Lewiston Dam was constructed in the lower main stem of the Clearwater River in 1927 and functioned as a blockage to movements of anadromous fish until the early 1940s (Matthews and Waples 1991). Spring and summer chinook salmon runs into the Clearwater system were reintroduced via hatchery outplants beginning in the late 1940s. As a result, Matthews and Waples (1991) concluded that even if a few native salmon survived the hydropower dams, "...the massive outplantings of non-indigenous stocks presumably substantially altered, if not eliminated, the original gene pool."

Spring-run and summer-run chinook salmon from the Snake River basin exhibit stream type life-history characteristics (Healey 1983). Eggs are deposited in late summer and early fall, incubate over the following winter and hatch in late winter/early spring of the following year. Juveniles rear through the summer, overwinter, and migrate to sea in the spring of their second year of life. Depending on the tributary and the specific habitat conditions, juveniles may migrate extensively from natal reaches into alternative summer rearing and/or overwintering areas. Snake River spring/summer-run chinook salmon return from the ocean to spawn primarily as 4- and 5-year old fish, after 2 to 3 years in the ocean. A small fraction of the fish return as 3-year-old 'jacks', of which a large majority are males.

2.1.1.2 Distribution and Trends

Direct estimates of annual runs of historical spring/summer-run chinook salmon to the Snake River are not available. Chapman (1986) estimated that the Columbia River produced 2.5 million to 3.0 million spring-run and summer-run chinook salmon per year in the late 1800s. Total spring-run and summer-run chinook salmon production from the Snake River basin contributed a substantial proportion of those returns; the total annual production of Snake River spring-run and summer-run chinook salmon may have been in excess of 1.5 million adult returns per year (Matthews and Waples 1991). Returns to Snake River tributaries had dropped to roughly 100,000 adults per year by the late 1960s (Fulton 1968). Increasing hatchery production contributed to subsequent years' returns, masking a continued decline in natural production.

The present range of spawning and rearing habitat for naturally-spawned Snake River spring/summer chinook salmon is primarily limited to the Grande Ronde, Salmon, Imnaha, and Tucannon River subbasins. Historic populations in the Clearwater River basin were extirpated; spring summer chinook population in the Clearwater River were not included as part of the listed ESU. Most Snake River spring/summer chinook salmon enter individual subbasins from May

through September. Juvenile Snake River spring/summer chinook salmon emerge from spawning gravels from February through June (Perry and Bjornn 1991). Typically, after rearing in their nursery streams for about one year, smolts begin migrating seaward in April and May (Bugert *et al.* 1990; Cannamela 1992). After reaching the mouth of the Columbia River, spring/summer chinook salmon probably inhabit nearshore areas before beginning their northeast Pacific Ocean migration, which lasts two to three years. Because of their timing and ocean distribution, these stocks are subject to very little ocean harvest. For detailed information on the life history and stock status of Snake River spring/summer chinook salmon, see Matthews and Waples (1991), NMFS (1991), and 56 FR 29542 (June 27, 1991).

The spring and summer chinook in the Columbia Basin, including those returning to the Snake River basin, have been managed as separate stocks. Historic databases therefore provide separate estimates for the spring and summer chinook components. Table 1 provides the estimated annual return of adult, natural-origin Snake River basin spring and summer chinook salmon returning to Lower Granite Dam from 1979 to 2003. For 2004, spring and summer forecasts were replaced by a spring/summer forecast. A preliminary recovery escapement goal for Snake River spring/summer chinook of 31,440 (counted at Ice Harbor Dam) was suggested in NMFS' Proposed Recovery Plan (NMFS 1995b). The interim guidance provided by Lohn (2002) sets target abundance levels for 15 geographic spawning aggregations, but these are not intended to replace the preliminary goals. Final goals will be developed through the recovery planning process as described by Lohn (2002).

Returns were variable through the 1980s, but declined further during early 90's to a record low returns in 1994 and 1995. Dam counts remained relatively low from through the 90's, but increased in 2000, 2001 and 2002. In 2001, the Lower Granite Dam count of 28,952 natural-origin spring/summer was a record high since 1979. In 2002, the Lower Granite Dam count of natural-origin spring/summer chinook was 37,695, surpassing the record high of 2001 by almost 10,000 fish and was at least three time higher than any return observed before 2001. The preliminary count of spring/summer chinook in 2003 was 18,502, which would be the third largest return since 1979.

In its recent review (69 FR 33102; June 14, 2004), NOAA Fisheries observed that spring/summer-run chinook in recent years exhibited a large increased over recent abundances. Many, but not all of the natural production areas within the ESU experienced large abundance as well, with two populations nearing the abundance levels specified in the NMFS' 1995 Proposed Snake River Recovery Plan (NMFS 1995b). However, approximately 79 percent of the 2001 return of spring-run chinook, for example, was of hatchery-origin. Short-term productivity trends were at or above replacement for the majority of the natural production areas in the ESU, although long-term productivity trends remain below replacement for all natural production areas, reflecting the severe declines since the 1960s. Although the number of spawning aggregations lost in the ESU due to the establishment of the Snake River mainstem dams is unknown, this ESU has a wide spatial distribution in a variety of locations and habitat types. The

Biological Review Team (BRT) considered it a positive sign that the out-of-ESU Rapid River broodstock has been phased out of the Grande Ronde system. There is no evidence of wide-scale straying by hatchery stocks, thereby alleviating diversity concerns somewhat. Nonetheless, the high level of hatchery production in the ESU complicates the assessments of trends in natural abundance and productivity.

There are fifteen artificial propagation programs producing spring/summer-run chinook salmon that are considered to be part of the Snake River spring/summer chinook ESU. A portion of these programs are managed to enhance listed natural populations, including the use of captive broodstock hatcheries in the upper Salmon River, Lemhi River, East Fork Salmon River, and Yankee Fork populations. These enhancement programs all use broodstock founded from the local native populations. Currently, the use of non-ESU broodstock source is restricted to Little Salmon/Rapid River (lower Salmon River tributary), mainstem Snake River at Hells Canyon, and the Clearwater River. These non-ESU programs appear to be isolated from natural production areas and are thought to have little negative impacts on the ESU.

NMFS' assessment of the effects of artificial propagation on the ESU extinction risk concluded that the hatchery programs collectively do not substantially reduce the extinction risk of the ESU in-total (69 FR 33135; June 3, 2004). Overall, these hatchery programs have contributed to the increase in total ESU abundance and in the number of natural spawners observed in recent years. The contribution of ESU hatchery programs to the productivity of the ESU in-total is uncertain. Some reintroduction and outplanting of hatchery fish above barriers and into vacant habitat has occurred, providing a slight benefit to the ESU spatial structure. All of the within-ESU hatchery stocks are derived from local natural populations and employ management practices designed to preserve genetic diversity. The Grande Ronde Captive Broodstock programs likely have prevented the extirpation of the local natural populations. Additionally, hatchery releases are managed to maintain wild fish reserves in the ESU in an effort to preserve natural local adaptation and genetic variability. Collectively, artificial propagation programs in the ESU provide benefits to the ESU abundance, spacial structure, and diversity, but have neutral or uncertain effects on ESU productivity.

The Snake River spring/summer chinook salmon ESU consists of 31 local spawning populations (subpopulations) spread over a large geographic area (Interior Columbia Basin Technical Review Team 2003). The number of fish returning to Lower Granite Dam is therefore divided among these subpopulations. The relationship between these subpopulations, and particularly the degree to which straying may occur between these is unknown. It is unlikely that these are all "populations" as defined by McElhany et al. (2000), which requires that they be isolated to the extent that the exchange of individuals among the populations does not substantially affect the population dynamics or extinction risk over a 100-year time frame. The 15 spawning aggregations identified by Lohn (2002) are also not necessarily synonymous with the population concept. Nonetheless, monitoring the status of the subpopulations or spawning aggregations

provides a more detailed indicator of the species' status than does the general measure of aggregate abundance.

Table 1. Estimates of natural-origin Snake River spring/summer chinook salmon counted at Lower Granite Dam, 1979-2003, and 2004 forecast return estimate (TAC 2004).

Year	Spring Chinook	Summer Chinook	Spring/Summer
1979	2,573	2,714	5,287
1980	3,478	2,404	5,882
1981	7,941	2,739	10,680
1982	7,117	3,531	10,648
1983	6,181	3,219	9,400
1984	3,199	4,229	7,428
1985	5,245	2,696	7,941
1986	6,895	2,684	9,579
1987	7,883	1,855	9,737
1988	8,581	1,807	10,388
1989	3,029	2,299	5,328
1990	3,216	3,342	6,558
1991	2,206	2,967	5,172
1992	11,134	441	11,574
1993	5,871	4,082	9,953
1994	1,416	183	1,599
1995	745	343	1,088
1996	1,358	1,916	3,274
1997	2,126	5,137	7,263
1998	5,089	2,913	8,002
1999	594	1,584	2,178
2000	3,266	4,067	7,333
2001	16,477	12,475	28,952
2002	34,144	3,552	37,695
2003*	13,043	5,459	18,502
2004 Forecast			40,973
* Preliminary			
Recovery Escapement Level (counted at Ice Harbor)			31,440

Seven of the subpopulations have been used as index stocks for the purpose of analyzing extinction risk and alternative actions that may be taken to meet survival and recovery requirements. These were selected primarily on the basis of the availability of long time series of abundance information. Recovery and threshold abundance levels have been developed for the index stocks and serve as reference points for comparison to observed escapements (Table 2). The recovery levels are abundance-related delisting objectives (C. Toole, NMFS, pers. comm.,

to/ P. Dygert, NMFS, January 21, 2000). The threshold levels were developed by the Biological Requirements Work Group (BRWG 1994) and represent levels at which uncertainties about processes or population enumeration are likely to become significant, and at which qualitative changes in processes are likely to occur. They were specifically not developed as an indicator of pseudo-extinction or as an absolute indicator of a “critical” threshold. Lohn (2002) provided Interim Abundance Targets for several of these index areas and apart from rounding number differences, these are consistent with the previously identified recovery levels (Table 2). Escapement estimates for the index stocks have generally been well below threshold levels in recent years. Spawner escapements in 2001-2003 were better than average for some of these index stocks, but the number of spawners was barely over the threshold level and still well below the recovery levels.

Table 2. Adult natural-origin spawners for Snake River spring/summer chinook index stocks, recovery levels identified by NMFS (1995b), and interim critical escapement thresholds suggested by BRWG (1994)*.

Brood year	Bear Valley	Marsh	Sulphur	Minam	Imnaha	Poverty Flats	Johnson
1979	209	83	90	30	234	84	73
1980	40	16	11	34	180	179	58
1981	151	115	43	47	445	193	106
1982	84	71	17	74	579	167	85
1983	165	59	45	76	427	338	154
1984	144	107	0	83	516	230	39
1985	295	196	62	404	623	358	184
1986	225	178	388	110	449	237	129
1987	455	271	68	161	401	546	177
1988	1,114	395	606	191	504	765	320
1989	91	80	43	115	134	236	99
1990	188	103	172	84	87	520	135
1991	180	71	213	80	71	488	146
1992	177	114	21	6	73	524	176
1993	709	218	264	123	357	786	344
1994	32	9	0	9	52	189	48
1995	16	0	4	37	55	74	20
1996	56	18	23	182	143	147	49
1997	218	107	42	123	153	228	231
1998	376	164	141	112	90	352	121
1999	75	0	0	94	75	138	47
2000	313	65	13	194	106	200	39
2001	709	344	95	305	287	753 ¹	353
2002	1,120	334	169	440	371	636 ¹	282
2003	1,264	605	178			749 ¹	576
Recovery Levels	900	450	300	450	850	850	300
BRWG Threshold	300	150	150	150	300	300	150

*Bear Valley, Marsh, Sulphur and Minam are spring chinook index stocks. Poverty Flats and Johnson are summer run index chinook stocks. Imnaha has an intermediate run timing.

¹ Adult spawner estimates are preliminary for South Fork Salmon River (Poverty Flat), 2001-03 (need jack prop.)

The upper mainstem South Fork, particularly the Stolle Meadows area above the hatchery weir, is in relatively better shape (Table 3). The suggested recovery threshold for Poverty Flats (850) and Stolle Meadows (690) were derived based on available estimates of the number of spawners necessary to achieve 70% of smolt production capacity.

Table 3. Escapement above the South Fork Salmon River Weir (Marshall 2004).

1993	2,675
1994	457
1995	211
1996	460
1997	3,671
1998	1,083
1999	1,698
2000	3,427
2001	10,216
2002	7,933
2003	6,524

For 2004, TAC combined the spring and summer chinook runsize information to provide a composite estimate for spring/summer chinook. Projected preseason Lower Granite Dam counts and Snake River tributary returns of spring/summer chinook in 2004 are presented in Appendix 1. The 2004 forecast for Columbia River mouth natural-origin spring/summer chinook destined for the Snake River is 40,973, and is higher than brood year escapements in 1998 and 1999 of 5,137 and 2,913, respectively. It compares to the recent 5-year average of 5,235. This number has not been updated by TAC inseason.

The CRI described above is designed to provide a standardized tool for assessing stock status and survival improvement necessary to meet survival and recovery objectives. For the Snake River spring/summer chinook salmon ESU as a whole, NMFS estimates that the median population growth rate (λ) over the base period² ranges from 0.96 to 0.80, decreasing as the effectiveness of hatchery fish spawning in the wild increases compared to the effectiveness of fish of wild origin (Tables B-2a and B-2b in McClure et al. 2000a). NMFS has also estimated median population growth rates and the risk of absolute extinction for the seven spring/summer

²Estimates of median population growth rate, risk of extinction, and the likelihood of meeting recovery goals are based on population trends observed during a base period beginning in 1980 and including 1999 adult returns. Population trends are projected under the assumption that all conditions will stay the same into the future.

chinook salmon index stocks,³ using the same range of assumptions about the relative effectiveness of hatchery fish. At the low end, assuming that hatchery fish spawning in the wild have not reproduced (i.e., hatchery effectiveness = 0), the risk of absolute extinction within 100 years for the wild component ranges from zero for Johnson Creek to 0.78 for the Imnaha River (Table B-5 in McClure et al. 2000a). At the high end, assuming that the hatchery fish spawning in the wild have been as productive as wild-origin fish (hatchery effectiveness = 100%), the risk of absolute extinction within 100 years ranges from zero for Johnson Creek to 1.00 for the wild component in the Imnaha River (Table B-6 in McClure et al. 2000a).

In its biological opinion regarding the FCRPS, NMFS summarized the prospects for survival and recovery in terms of the estimated percent change in survival needed to achieve survival and recovery indicator criteria after implementing the hydro survival improvements of the Reasonable and Prudent Alternative (NMFS 2000b). These are then identified as the offsite mitigation performance standards for the FCRPS (see section 9.2.2.2.2 in NMFS 2000b). In general, the low and high values in the table reflect uncertainty about the effectiveness of hatchery spawners in the wild, although the summary statistics do not reflect the full measure of uncertainty in the estimates. These estimates suggest that three of the seven Snake River spring/summer chinook index stocks require no additional survival changes beyond those expected through modification of the hydrosystem under the RPA to meet the survival and recovery indicator criteria, including Johnson Creek and Poverty Flats index area in particular, both in the South Fork Salmon River. The other four index stocks require additional survival improvements ranging from 0 to 66% (Table 4). Inherent in the overall analysis is the assumption that harvest impacts will remain at the levels reflected in the most recent biological opinions. Generally speaking, increases in the harvest rates, particularly over the long-term, will change these statistics and increase the level of survival improvements required in other sectors. Harvest increases, beyond those assumed, would otherwise simply reflect a further increase of risk to the species.

2.2 Environmental Baseline

2.2.1 Factors affecting the Environmental Baseline

Environmental baselines for biological opinions are defined by regulation at 50 CFR 402.02, which states that an environmental baseline is the physical result of all past and present state, Federal, and private activities in the action area along with the anticipated impacts of all proposed Federal projects in the action area (that have already undergone formal or early section 7 consultation). The environmental baseline for this biological opinion is therefore the result of the impacts a great many activities (summarized below) have had on Snake River spring/summer chinook salmon survival and recovery. Put another way, the baseline is the culmination of the

³ McClure et al. (2000b) have calculated population trend parameters for additional Snake River spring/summer chinook salmon stocks.

effects that multiple activities have had on the species' *biological requirements* and, by examining those individual effects, it is possible to describe the species' status in the action area.

Many of the biological requirements for Snake River spring/summer chinook salmon in the action area can best be expressed in terms of essential habitat features. That is, the ESU requires adequate: (1) substrate (especially spawning gravel), (2) water quality, (3) water quantity, (4) water temperature, (5) water velocity, (6) cover/shelter, (7) food, (8) riparian vegetation, (9) space, and (10) migration conditions (February 16, 2000, 65 FR 7764). The best scientific information presently available demonstrates that a multitude of factors, past and present, have contributed to the decline of west coast salmonids by adversely affecting these essential habitat features. NMFS reviewed much of that information in its recently reinitiated consultation on operation of the Federal Columbia River Power System (FCRPS) (NMFS 2000b). That review is summarized in the sections below.

Table 4. Estimated percentage change (i.e., additional improvement in life-cycle survival) needed to achieve survival and recovery indicator criteria after implementing the hydro survival improvements in the RPA. (A value of 26, for example, indicates that the egg-to-adult survival rate, or any constituent life-stage survival rate, must be multiplied by a factor of 1.26 to meet the indicator criteria.)

Snake River spring/summer chinook salmon Spawning Aggregation	Needed Survival Change	
	Low	High
Bear Valley/Elk creeks	0	0
Imnaha River	26	66
Johnson Creek	0	0
Marsh Creek	0	12
Minam River	0	28
Poverty Flats	0	0
Sulphur Creek	0	5

Note: Low and High estimates are based on a range of assumptions, as described in the text.

2.2.2.1 The Mainstem Hydropower System

Hydropower development on the Columbia River has dramatically affected anadromous salmonids in the basin. Storage dams have eliminated spawning and rearing habitat and altered the natural hydrograph of the Snake and Columbia Rivers – decreasing spring and summer flows and increasing fall and winter flows. Power operations cause flow levels and river elevations to fluctuate – slowing fish movement through reservoirs, altering riparian ecology, and stranding

fish in shallow areas. The 13 dams in the Snake and Columbia River migration corridors kill smolts and adults and alter their migrations. The dams have also converted the once-swift river into a series of slow-moving reservoirs – slowing the smolts’ journey to the ocean and creating habitat for predators. Because the Snake River spring/summer chinook salmon must navigate past to eight major hydroelectric projects during their up- and downstream migrations (and experience the effects of other dam operations occurring upstream from their ESU boundary), they are subject to all the impacts described above. For more information on the effects of the mainstem hydropower system, please see NMFS (2000b).

2.2.2.2 Human-Induced Habitat Degradation

The quality and quantity of freshwater habitat in much of the Columbia River Basin have declined dramatically in the last 150 years. Forestry, farming, grazing, road construction, hydrosystem development, mining, and other development have radically changed habitat conditions in the basin. Water quality in streams throughout the Columbia River Basin has been degraded by human activities such as dams and diversion structures, water withdrawals, farming and animal grazing, road construction, timber harvest activities, mining activities, and development. Over 2,500 streams, river segments, and lakes in the Northwest do not meet Federally-approved, state and Tribal water quality standards and are now listed as water quality limited under section 303(d) of the Clean Water Act. Tributary water quality problems contribute to poor water quality when sediment and contaminants from the tributaries settle in mainstem reaches and the estuary.

Most of the water bodies in Oregon, Washington, and Idaho on the 303(d) list do not meet water quality standards for temperature. High water temperatures adversely affect salmonid metabolism, growth rate, and disease resistance, as well as the timing of adult migrations, fry emergence, and smoltification. Many factors can cause high stream temperatures, but they are primarily related to land-use practices rather than point-source discharges. Some common actions that cause high stream temperatures are the removal of trees or shrubs that directly shade streams, water withdrawals for irrigation or other purposes, and warm irrigation return flows. Loss of wetlands and increases in groundwater withdrawals contribute to lower base-stream flows which, in turn, contribute to temperature increases. Activities that create shallower streams (e.g., channel widening) also cause temperature increases.

Pollutants also degrade water quality. Salmon require clean gravel for successful spawning, egg incubation, and the emergence of fry. Fine sediments clog the spaces between gravel and restrict the flow of oxygen-rich water to the incubating eggs. Excess nutrients, low levels of dissolved oxygen, heavy metals, and changes in pH also directly affect the water quality for salmon and steelhead.

Water quantity problems are also an important cause of habitat degradation and reduced fish production. Millions of acres of land in the basin are irrigated. Although some of the water withdrawn from streams eventually returns as agricultural runoff or groundwater recharge, crops

consume a large proportion of it. Withdrawals affect seasonal flow patterns by removing water from streams in the summer (mostly May through September) and restoring it to surface streams and groundwater in ways that are difficult to measure. Withdrawing water for irrigation, human consumption, and other uses increases temperatures, smolt travel time, and sedimentation. Return water from irrigated fields introduces nutrients and pesticides into streams and rivers. Water withdrawals (primarily for irrigation) have lowered summer flows in nearly every stream in the basin and thereby profoundly decreased the quantity and quality of habitat.

Blockages that stop downstream and upstream fish movement exist at many dams and barriers, whether they are for agricultural, hydropower, municipal/industrial, or flood control purposes. Culverts that are not designed for fish passage also block upstream migration. Migrating fish are often killed when they are diverted into unscreened or inadequately screened water conveyances or turbines. While many fish-passage improvements have been made in recent years, manmade structures continue to block migrations or kill fish throughout the basin.

On the landscape scale, human activities have affected the timing and amount of peak water runoff from rain and snowmelt. Forest and range management practices have changed vegetation types and density which, in turn, affect runoff timing and duration. Many riparian areas, flood plains, and wetlands that once stored water during periods of high runoff have been destroyed by development that paves over or compacts soil – thus increasing runoff and altering its natural pattern.

Land ownership has also played its part in the region's habitat and land-use changes. Federal lands, which compose 50 percent of the basin, are generally forested and influence upstream portions of the watersheds. While there is substantial habitat degradation across all ownerships, in general, habitat in many headwater stream sections is in better condition than in the largely non-Federal lower portions of tributaries (Doppelt *et al.* 1993; Frissell 1993; Henjum *et al.* 1994; Quigley and Arbelbide 1997). In the past, valley bottoms were among the most productive fish habitats in the basin (Stanford and Ward 1992; Spence *et al.* 1996; ISG 1996). Today, agricultural and urban land development and water withdrawals have substantially altered the habitat for fish and wildlife. Streams in these areas typically have high water temperatures, sedimentation problems, low flows, simplified stream channels, and reduced riparian vegetation.

At the same time Snake River spring/summer chinook salmon habitat was being destroyed by water withdrawals, water impoundments in other areas dramatically reduced Snake River spring/summer chinook salmon habitat by inundating large amounts of spawning and rearing habitat and reducing migration corridors, for the most part, to a single channel. Floodplains have been reduced in size, off-channel habitat features have been lost or disconnected from the main channel, and the amount of large woody debris (large snags/log structures) in rivers has been reduced. Most of the remaining habitats are affected by flow fluctuations associated with reservoir management.

The Columbia River estuary (through which all the basin's species – including Snake River spring/summer chinook salmon – must pass) has also been changed by human activities. Historically, the downstream half of the estuary was a dynamic environment with multiple channels, extensive wetlands, sandbars, and shallow areas. The mouth of the Columbia River was about four miles wide. Winter and spring floods, low flows in late summer, large woody debris floating downstream, and a shallow bar at the mouth of the Columbia River kept the environment dynamic. Today, navigation channels have been dredged, deepened, and maintained; jetties and pile-dike fields have been constructed to stabilize and concentrate flow in navigation channels; marsh and riparian habitats have been filled and diked; and causeways have been constructed across waterways. These actions have decreased the width of the mouth of the Columbia River to two miles and increased the depth of the Columbia River channel at the bar from less than 20 to more than 55 feet. Sand deposition at river mouths has extended the Oregon coastline approximately four miles seaward and the Washington coastline approximately two miles seaward (Thomas 1981).

More than 50 percent of the original marshes and spruce swamps in the estuary have been converted to industrial, transportation, recreational, agricultural, or urban uses. More than 3,000 acres of intertidal marsh and spruce swamps have been converted to other uses since 1948 (Lower Columbia River Estuary Program 1999). Many wetlands along the shore in the upper reaches of the estuary have been converted to industrial and agricultural lands after levees and dikes were constructed. Furthermore, water storage and release patterns from reservoirs upstream of the estuary have changed the seasonal pattern and volume of discharge. The peaks of spring/summer floods have been reduced, and the amount of water discharged during winter has increased.

Human-caused habitat alterations have also increased the number of predators feeding on Snake River spring/summer chinook salmon and steelhead. For example, researchers estimated that a population of terns on Rice Island (created under the Columbia River Channel Operation and Maintenance Program) consumed six to 25 million out-migrating salmonid smolts during 1997 (Roby *et al.* 1998) and seven to 15 million out-migrating smolts during 1998 (Collis *et al.* 1999). Even after considerable efforts by Federal and state agencies, between 5 and 7 million smolts were consumed in 2001. As another example, populations of Northern pike minnow (a salmonid predator) in the Columbia River has skyrocketed since the advent of the mainstem dams and their warm, slow-moving reservoirs.

To counteract all the ill effects listed in this section, Federal, state, Tribal, and private entities have – singly and in partnership – begun recovery efforts to help slow and, eventually, reverse the decline of salmon and steelhead populations. Nevertheless, while these efforts represent a number of good beginnings, it must be stated that much remains to be done to recover Snake River spring/summer chinook salmon. Full discussions of these efforts can be found in the FCRPS biological opinion (NMFS 2000b).

2.2.2.3 Hatcheries

For more than 100 years, hatcheries in the Pacific Northwest have been used to (a) produce fish for harvest and (b) replace natural production lost to dam construction and other development – not to protect and rebuild naturally produced salmonid populations. As a result, most salmonids returning to the region are primarily derived from hatchery fish. In 1987, for example, 95 percent of the coho salmon, 70 percent of the spring chinook salmon, 80 percent of the summer chinook salmon, 50 percent of the fall chinook salmon, and 70 percent of the steelhead returning to the Columbia River Basin originated in hatcheries (CBFWA 1990). Because hatcheries have traditionally focused on providing fish for harvest, it is only recently that the substantial adverse effects of hatcheries on natural populations been demonstrated. For example, the production of hatchery fish, among other factors, has contributed to the 90 percent reduction in natural coho salmon runs in the lower Columbia River over the past 30 years (Flagg *et al.* 1995).

NMFS has identified four primary ways hatcheries harm wild-run salmon and steelhead: (1) ecological effects, (2) genetic effects, (3) overharvest effects, and (4) masking effects (NMFS 2000b). Ecologically, hatchery fish can predate on, displace, and compete with natural fish. These effects are most likely to occur when fish are released in poor condition and do not migrate to marine waters, but rather remain in the streams for extended rearing periods. Hatchery fish also may transmit hatchery-borne diseases, and hatcheries themselves may release disease-carrying effluent into streams. Hatchery fish can affect the genetic variability of native fish by interbreeding with them. Interbreeding can also result from the introduction of stocks from other areas. Interbred fish are less adapted to the local habitats where the original native stock evolved and may therefore be less productive there.

In many areas, hatchery fish provide increased fishing opportunities. However, when natural fish mix with hatchery stock in these areas, naturally produced fish can be overharvested. Moreover, when migrating adult hatchery and natural fish mix on the spawning grounds, the health of the natural runs and the habitat's ability to support them can be overestimated because the hatchery fish mask the surveyors' ability to discern actual natural run status.

Currently, the role hatcheries play in the Columbia Basin is being redefined under the Basinwide Salmon Recovery Strategy (Federal Caucus 2000) from simple production to supporting species recovery. These efforts will focus on maintaining species diversity and supporting weak stocks. The program will also have an associated research element designed to clarify interactions between natural and hatchery fish and quantify the effects artificial propagation has on natural fish. The final facet of the strategy is to use hatcheries to create fishing opportunities that are benign to listed populations (e.g., terminal area fisheries). For more detail on the use of hatcheries in recovery strategies, please see the Basinwide Salmon Recovery Strategy.

2.2.2.4 Harvest

Salmon and steelhead have been harvested in the Columbia basin as long as there have been people there. For thousands of years, native Americans have fished on salmon and other species in the mainstem and tributaries of the Columbia River for ceremonial and subsistence use and for barter. Salmon were possibly the most important single component of the native American diet, and were eaten fresh, smoked, or dried (Craig and Hacker 1940; Drucker 1965). A wide variety of gears and methods were used, including hoop and dip nets at cascades such as Celilo and Willamette Falls, to spears, weirs, and traps (usually in smaller streams and headwater areas) (NRC 1996; Drucker 1965).

Commercial fishing developed rapidly with the arrival of European settlers and the advent of canning technologies in the late 1800s. The development of non-Indian fisheries began in about 1830; by 1861, commercial fishing was an important economic activity. The early commercial fisheries used gill nets, seines hauled from shore, traps, and fish wheels. Later, purse seines and trolling (using hook and line) fisheries developed. Recreational fishing began in the late 1800s, occurring primarily in tributary locations (ODFW and WDFW 1998). Steelhead have formed a major component of these fisheries for decades.

Initially, the non-Indian fisheries targeted spring and summer chinook salmon, and these runs dominated the commercial harvest during the 1800s. Eventually the combined ocean and freshwater harvest rates for Columbia River spring and summer chinook salmon exceeded 80 percent and sometimes 90 percent of the run – accelerating the species' decline (Ricker 1959). From 1938 to 1955, the average harvest rate dropped to about 60 percent of the total spring chinook salmon run and appeared to have a minimal effect on subsequent returns (NMFS 1991). Until the spring of 2000 – when a relatively large run of hatchery spring chinook salmon returned and provided a small commercial Tribal fishery – no commercial season for spring chinook salmon had taken place since 1977. Present Columbia River harvest rates are very low compared with those from the late 1930s through the 1960s (NMFS 1991).

Salmonids' capacity to produce more adults than are needed for spawning offers the potential for sustainable harvest of naturally produced (versus hatchery-produced) fish. This potential can be realized only if two basic management requirements are met: (1) enough adults return to spawn and perpetuate the run, and (2) the productive capacity of the habitat is maintained. Catches may fluctuate in response to such variables as ocean productivity cycles, periods of drought, and natural disturbance events, but as long as the two management requirements are met, fishing can be sustained indefinitely. Unfortunately, both prerequisites for sustainable harvest have been violated routinely in the past. The lack of coordinated management across jurisdictions, combined with competitive economic pressures to increase catches or to sustain them in periods of lower production, resulted in harvests that were too high and escapements that were too low. At the same time, habitat has been increasingly degraded, reducing the capacity of the salmon stocks to produce numbers in excess of their spawning escapement requirements.

Fish harvest in the Columbia River basin affects the listed species by incidentally taking them in fisheries that target non-listed species. Snake River spring/summer chinook salmon are not harvested in ocean fisheries (Chapman *et al.* 1995). The largest potential impacts on Snake River spring/summer chinook salmon come from treaty Indian and non-Indian fisheries in the Columbia River mainstem and fisheries in the Snake River Basin (Myers *et al.* 1998). Most take is in the form of catch and retention, mortalities resulting from hooking and release, and mortalities resulting from encounters with fishing gear as a consequence of fishery activities. Two recent opinions describe harvest rate impacts from mainstem Columbia River fisheries accruing to listed salmonids. Both opinions conclude that, due to the constraints set on harvest levels as described in the opinions, the activities associated with the treaty Indian and non-Indian fisheries during the winter/spring/summer and fall seasons were not likely to jeopardize the continued existence of any of the listed species (NMFS 2001b; NMFS 2001c). The development of fishery regimes for the Columbia River mainstem includes evaluation of escapement needs and impacts to Snake River spring/summer chinook salmon.

2.2.2.5 Natural Conditions

Natural changes in the freshwater and marine environments play a major role in salmonid abundance. Recent evidence suggests that marine survival among salmonids fluctuates in response to 20- to 30-year cycles of climatic conditions and ocean productivity (Hare *et al.* 1999). This phenomenon has been referred to as the Pacific Decadal Oscillation; this has also been referred to as the Bidecadal Oscillation (Mantua *et al.* 1997). In addition, large-scale climatic regime shifts, such as El Niño, appear to change ocean productivity. During the first part of the 1990s, much of the Pacific Coast was subject to a series of very dry years. More recently, severe flooding has adversely affected some stocks (e.g., the low returns of Lewis River bright fall chinook salmon in 1999).

A key factor affecting many West Coast stocks—including Snake River spring/summer chinook salmon—has been a general 30-year decline in ocean productivity. The mechanism whereby stocks are affected is not well understood, partially because the pattern of response to these changing ocean conditions has differed among stocks—presumably due to differences in their ocean timing and distribution. It is presumed that survival is driven largely by events occurring between ocean entry and recruitment to a subadult life stage (NMFS 2000b).

Salmon and steelhead are exposed to high rates of natural predation, particularly during freshwater rearing and migration stages. Ocean predation may also contribute to substantial natural mortality, although it is not known to what degree. In general, salmonids are prey for pelagic fishes, birds, and marine mammals, including harbor seals, sea lions, and killer whales. There have been recent concerns that the rebound of seal and sea lion populations – following their protection under the Marine Mammal Protection Act of 1972 – has caused a substantial number of salmonid deaths.

2.2.2.6 Summary

In conclusion, given all the factors for decline—even taking into account the corrective measures being implemented—it is still clear that the Snake River spring/summer chinook salmon ESU’s biological requirements are currently not being met under the environmental baseline. Thus their status is such that there must be a substantial improvement in the environmental conditions of their habitat (over those currently available under the environmental baseline). Any further degradation of the environmental conditions could have a large impact because the ESU is already at risk. In addition, there must be efforts to minimize impacts caused by dams, harvest, hatchery operations, habitat degradation, and unfavorable natural conditions.

3.0 EFFECTS OF THE ACTION

The purpose of this section is to identify what effects NMFS’ issuance of an incidental take statement will have on endangered Snake River spring/summer chinook salmon. To the extent possible, this will include analyzing effects at the population level. Where information on Snake River spring/summer chinook salmon is lacking at the population level, this analysis assumes that the status of each affected population is parallel to that of the ESU as a whole. The method NMFS uses for evaluating effects is discussed first, followed by discussions of the general effects fishery activities are known to have.

3.1 Evaluating the Effects of the Action - Applying ESA section 7(a)(2) standards

Over the course of the last decade and hundreds of ESA section 7 consultations, NMFS developed the following four-step approach for applying the ESA section 7(a)(2) standards when determining what effect a proposed action is likely to have on a given listed species. What follows here is a summary of that approach; for more detail please see *The Habitat Approach: Implementation of Section 7 of the Endangered Species Act for Actions Affecting the Habitat of Pacific Salmonids* (NMFS 1999b).

1. Define the biological requirements and current status of the listed species.
2. Evaluate the relevance of the environmental baseline to the species’ current status.
3. Determine the effects of the proposed or continuing action on listed species and their habitat.
4. Determine whether the species can be expected to survive with an adequate potential for recovery under (a) the effects of the proposed (or continuing) action, (b) the effects of the environmental baseline, and (c) any cumulative effects—including all measures being taken to improve salmonid survival and recovery.

Information related to steps one and two is discussed in preceding sections. Information of steps three and four are is discussed below.

The fourth step above requires a two-part analysis. The first part focuses on the action area and defines the proposed action's effects in terms of the species' biological requirements in that area (i.e., impacts on essential habitat features). The second part focuses on the species itself. It describes the action's impact on individual fish—or populations, or both—and places that impact in the context of the ESU as a whole. Ultimately, the analysis seeks to answer the questions of whether the proposed action is likely to jeopardize a listed species' continued existence or destroy or adversely modify its critical habitat.

3.2 Effects on Habitat

Previous sections have detailed the scope of the Snake River spring/summer chinook salmon habitat in the action area, described the essential features of that habitat, and depicted its present condition. The discussion here focuses on how those features are likely to be affected by the proposed actions.

The fishing activities will occur within a 30-mile stretch of the South Fork Salmon River, from the confluence of the East Fork South Fork Salmon River to 100 yards from the South Fork Salmon River weir. The fishing activities will be limited to the time of active migration of returning spawners and will stop once spawning starts. Therefore there will be no direct effects on redds. The type of gear and method of fishing in the proposed fisheries are minimally intrusive in terms of their effect on habitat. None of them will measurably affect any of the 10 essential fish habitat features listed earlier (i.e., stream substrates, water quality, water quantity, food, streamside vegetation, etc.). The proposed activities are also of short duration. Therefore, NMFS concludes that the proposed activities are unlikely to have an adverse impact on Snake River spring/summer chinook salmon habitat, and thus will have little, if any, effect on the contribution of that habitat to the species' likelihood of survival and recovery.

3.3 Effects on Snake River Spring/Summer Chinook Salmon ESU

3.3.1 Factors to Be Considered

Fisheries may affect salmonid ESUs in several ways which have bearing on the likelihood of continued survival of the species. Immediate mortality effects accrue from the hooking or netting and subsequent retention of individual fish — those effects are considered explicitly in this opinion.

In addition, mortality of any fish which is caught and released may occur. This is important to consider in the development of fishery management actions, as catch-and-release mortalities primarily result from implementation of management regulations designed to reduce mortalities to listed fish through live release. The catch-and-release mortality rate varies for different gear types, different species, and different fishing conditions, and those values are often not well known. Catch-and-release mortality rates have been estimated from available data and applied by TAC in the calculation of impacts to fish listed and proposed for listing evaluated in this consultation. The TAC applies a 10% incidental mortality rate to salmon caught and released

during recreational fishing activities. The TAC also applies a 1% incidental mortality rate to salmon caught and released using dipnets.

One of the primary considerations in evaluating fisheries is the demographic effects on the survival and recovery of listed species. An important concern for many of the ESUs is the small size of the populations making up the ESU. Even when population trends are stable, a small population may be at substantial risk of extinction due to environmental, demographic, or genetic stochasticity. The analysis of the proposed South Fork Salmon River fisheries must be made in the context of whether the removal of fish from the upstream migrating salmonids will measurably reduce the sizes of extant populations and increase the risk of extinction of the ESU due to small constituent population sizes. NMFS previously used the 39 subpopulations identified in Lichatowich et al. (1993), and more recently identified 15 spawning aggregations for use on an interim basis (Lohn 2002). More recently, NMFS used the 31 populations identified in the July, 2003 Working Draft of the Interior Columbia Basin Technical Review Team.

3.3.2 Effects of the Proposed Action

The South Fork Salmon River fishery will target unlisted hatchery-origin fish returning to the South Fork Salmon River hatchery weir in numbers exceeding the needs of the propagation program. The expected return of unlisted hatchery-origin fish to the area that are available for harvest in 2004 is 11,168 fish based on the preseason forecast of 12,568 and the hatchery escapement objective of 1,400 fish. Areas open to fishing would include the South Fork Salmon River weir (RM 72) downstream to the confluence with the East Fork South Fork (RM 42).

The Nez Perce Tribe, the Shoshone-Bannock Tribes and the IDFG have all proposed fisheries in the South Fork Salmon River. The Nez Perce Tribe and Shoshone-Bannock Tribes propose to fish from the weir down through the Poverty Flats areas to the confluence with the East Fork South Fork. The Shoshone-Bannock Tribes propose to harvest 3,991 unlisted summer chinook with an incidental take of up to 185 total listed fish in the South Fork Salmon River below the weir in 2004, and propose to limit the lethal take of listed fish to 38 listed fish while fishing below the Poverty Flats bridge. The take of 38 listed fish while fishing below Poverty Flats Bridge would include 8 listed fish destined to spawn in the Poverty Flats index area. The Nez Perce Tribe propose to harvest 5,584 unlisted summer chinook with an incidental take of up to 133 listed fish in the South Fork Salmon River below the weir in 2004, but do not define where the take will occur and do not provide measures to limit the take of listed fish in the Poverty Flats area. The IDFG proposes to harvest 3,909 unlisted summer chinook in the South Fork Salmon River with an incidental take of up to 94 total listed fish, between the Poverty Flats Bridge and the South Fork Salmon River weir. IDFG proposes is also proposing to harvest 1,675 unlisted summer chinook in the Lower Salmon River. As a result, the combined proposals for harvest in the South Fork Salmon River would total 15,159 unlisted fish, and a total incidental take of 412 listed fish.

NMFS has identified and managed in the past for five breeding units or subpopulations in the South Fork Salmon River (BRWG 1994; Bevan et al. 1994; NMFS 1995b; NMFS 2000a, 2001a, and 2002; NMFS 2003) including:

- lower mainstem; South Fork Salmon River mouth to Blackmare Ck. (including Poverty Flats)
- upper mainstem; Blackmare Ck. to Stolle Meadows
- Secesh River
- East Fork South Fork
- Johnson Ck.

The Secesh, East Fork South Fork, and Johnson Creek are tributaries of the lower mainstem South Fork. These are natural production areas. Hatchery fish are also released into Johnson Creek using Johnson Creek-origin broodstock. The proposed Tribal fisheries will occur above the confluence with these tributaries; fish returning to these tributaries are therefore unlikely to be affected by the proposed fisheries. The effects of the fisheries are therefore limited to two of the five subpopulations in the South Fork Salmon River. None of the other 34 subpopulations located outside of the South Fork Salmon River will be adversely affected by the fisheries.

It is unclear whether these units would all be distinguished as “populations” as defined in NMFS’ recent Viable Salmonid Population paper (McElhany et al. 2000). However, review of the available genetic data indicates that genetic differences between major tributaries such as the Secesh, Johnson Creek, and mainstem are as large as or larger than those between different tributaries in other major Snake Basins (e.g., in the Upper Salmon, Grande Ronde, Imnaha). Historically, it is probable that fish returning to the Poverty Flats area on the lower mainstem and the Stolle Meadows area on the upper mainstem were distinct as there is geographic separation between them that is magnified by elevation differences. There are also run timing differences between these stocks. Earlier spawn timing at Stolle Meadows is evident.

The Poverty Flat and Stolle Meadows stocks do not now show consistent genetic differences. It is clear that they have been affected by past events and practices, particularly the early brood stock and hatchery management practices at the South Fork Hatchery. These past practices have likely reduced differences between the populations within the mainstem South Fork, but have not resulted in their complete homogenization (R. Waples, NMFS, pers. Comm., June 2, 2000, P Dygert, NMFS). NMFS considers it important to continue to maintain as much of the inter-stock diversity as possible as part of an overall recovery strategy. NMFS therefore concludes that the fisheries should be managed in a way that accounts for the relative status of the Poverty Flats and Stolle Meadows stocks. To accomplish this objective, during previous consultations NMFS developed during past consultations separate harvest rate schedules for the Poverty Flats and Stolle Meadows summer chinook salmon stocks of the South Fork Salmon River (NMFS 2000a, 2001a, and 2002; NMFS 2003).

In February 2004, NMFS wrote a letter to the Nez Perce Tribe, The Shoshone-Bannock Tribes and the IDFG describing the criteria that would be used in evaluating their fishery proposals in the South Fork Salmon River. These are the same criteria NMFS used in recent years, and, pending development of new information, what will likely be used for the foreseeable future.

NMFS developed and has used separate harvest rate schedules for the Poverty Flats and Stolle Meadows stocks of the South Fork Salmon River since 2000 (NMFS 2000a, 2001a, and 2002; NMFS 2003). These harvest rate schedules provide guidance for evaluating proposed fisheries. The first harvest rate schedule (Table 5) depends on the expected return of natural-origin spawners to the Poverty Flats index area; the second (Table 6) depends on the forecast return to the weir of natural-origin and hatchery-origin supplementation fish and the resulting expected number that would be passed above the weir as a result of the hatchery/genetic management protocol. Tables 5 and 6 are tied to the suggested recovery and threshold abundance levels. These threshold abundance levels should ultimately be reviewed and revised if necessary, but for now provide reasonable benchmarks of known origin that can be used to scale the fisheries. These schedules thus provide a framework for evaluating proposed fisheries.

NMFS is relying on preseason estimates of expected returns developed by TAC and provided in the biological assessments (LaPointe 2004 and Calica 2004). It is important to note that the preseason estimates to Stolle Meadows will be updated inseason based on fish counts at the weir and other information. The resulting harvest rate and the associated numerical limit on take for this stock may change inseason as determined by the harvest rate schedule (Table 6). Furthermore, the harvest rate schedules in Tables 5 and 6 will apply and define both, the overall take limits and how these limits may be distributed between the two fishery areas.

Table 5. Harvest rate schedule for the Poverty Flats index area (section 28 of the South Fork Salmon River). Interim threshold levels are 300 and 850.

% of Goal	Expected Return of N-O* Fish to Spawning Area	Harvest Rate - % of listed Fish	Harvest - # of listed Fish
	<50		0
	51 - 150		2
	151 - 300	2%	2 - 6
< 50%	301 - 425	4%	12 - 17
51% - 75%	426 - 638	6%	26 - 38
76% - 108%	639 - 918	8%	51 - 73
> 108%	> 919	35% (of margin > 918)	> 73

Table 6. Harvest rate schedule for the Stolle Meadows index area (section 26 of the South Fork Salmon River). Interim threshold levels are 300 and 690.

% of Goal	Expected Return Above Weir	Harvest Rate - % of Listed Fish	Harvest - # of Listed Fish
	<50		0
	51 - 150		2
< 50%	151 - 345	4%	6-14
51% - 75%	345 - 518	9%	31-47
76% - 112%	519 - 773	12%	62-93
> 112%	> 773	35% (of margin > 773)	>93

The projected return to the Poverty Flats area after taking into account Idaho's Lower Salmon River impacts is 388, compared to suggested lower threshold and recovery levels of 300 and 850, respectively (NMFS 2000a) (Table 2). The expected return to Poverty Flats of 388 spawners in 2004 is less than the last 5-year average returns (495) and higher than the contributing brood years, or 138 and 200 for 1999 and 2000, respectively (Table 2).

The area above the weir is managed for natural production, but is supplemented with a uniquely identified group of listed hatchery-origin fish, each of which had at least one natural-origin parent. (The group of fish being targeted in the fishery is unlisted hatchery-origin fish that are the product of two hatchery-origin parents.) The existing propagation program protocol requires that a certain number of natural-origin and listed hatchery-origin fish (32 adults from each group) be taken back to the hatchery to maintain the on-station brood stock program. The remaining fish are passed above the weir to spawn naturally, subject to the condition that no more than half of the fish going above the weir will be from the listed supplementation group. No "reserve" group fish (hatchery x hatchery crosses), which are the target of the proposed fisheries, are passed above the weir.

The effect of using these harvest rate schedules in 2004 is that fishing opportunity in the lower mainstem area is relatively limited. Given the anticipated return of 388 fish, the allowable harvest of natural-origin fish destined for the Poverty Flats index area is 16 fish ($0.04 \times 388 = 16$). However, since fish destined for the upper area migrate through Poverty Flats, the lethal take limit of natural-origin fish on Poverty Flats would be 76 fish (i.e. $16/[388/(39 + 388 + 413 + 1062)] = 76$). The lethal take of 76 listed fish from Poverty Flats would presumably include 16 fish that were destined for Poverty Flats (section 28), 17 listed fish that destined for section 27, 2 fish destined for section 29, and 42 listed fish destined for Stolle Meadows (section 26 above the weir) (see Appendix 2). This calculation is conservative in that it assumes that there are no timing differences between listed fish from the respective areas and that they are therefore equally likely to be caught in fisheries in the lower area. In fact, there is reason to believe that fish returning to the Poverty Flats area have somewhat later return timing and may be more likely to hold in areas below the Poverty Flats index area. The probability of taking a fish destined for

Poverty Flats is likely therefore lower than is reflected by the above assumption that catch is proportional to relative abundance. Nonetheless, that is the assumption used; once 76 listed fish are taken from the Poverty Flats area, that area would be closed to further harvest.

Given the anticipated preseason returns of listed natural and listed hatchery-origin fish to the weir (671 and 391, respectively), the expected number of fish over the weir is 1062. At that return, the allowable harvest rate, derived from the above schedule, is 12% of 773 plus 35% of 289 (1,062-773), for a total of 194 listed fish (Appendix 2). Assuming that the tribes fish to the allowable incidental take limit in Poverty Flats, a take of 42 Stolle Meadows fish (42 out of 76 total taken while fishing in Poverty Flats) would result inside Poverty Flats. Therefore, the Stolle Meadows balance left is 152 (194-42). Because there are an additional 413 listed natural-origin fish destined to return to the area between Poverty Flats bridge and the South Fork trap, the adjusted allowable catch while fishing above Poverty Flats and below the weir is $152/[1,062/(413+1,062)] = 210$ fish (Appendix 2). The proposed total take associated with the South Fork Salmon River fisheries is 412 listed fish, which is at least 125 more listed fish than provided for by the two abundance based harvest rate schedules in 2004.

4.0 CUMULATIVE EFFECTS

Cumulative effects include the effects of future state, Tribal, local or private actions not involving Federal activities that are reasonably certain to occur within the action area subject to this consultation. Future Federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to section 7 of the Act.

Tribal, state, and local government actions will likely be in the form of legislation, administrative rules or policy initiatives. Government and private actions may encompass changes in land and water uses — including ownership and intensity — any of which could impact listed species or their habitat. Government actions are subject to political, legislative, and fiscal uncertainties. These realities, added to the geographic scope of the ESU in general and action area in particular, which encompasses numerous government entities exercising various authorities and the many private landholding, make any analysis of cumulative effects difficult and speculative. For more information on the various efforts being made at the local, Tribal, state, and national levels to conserve Snake River spring/summer chinook salmon and other listed species, see NOAA Fisheries (2002).

Non-Federal actions are likely to continue affecting listed species. The cumulative effects in the action area are difficult to analyze because of the different resource authorities in the action area, the uncertainties associated with government and private actions, and the changing economies of the region. Whether these effects will increase or decrease is a matter of speculation; however, based on the trends identified in the baseline, the adverse cumulative effects are likely to increase. Although tribal, state, and local governments have developed plans and initiatives to

benefit listed fish, these plans must be applied and sustained in a comprehensive way before NMFS can consider them “reasonably foreseeable” in its analysis of cumulative effects.

5.0 INTEGRATION AND SYNTHESIS OF EFFECTS

The biological opinion and jeopardy determination relates to the Snake River spring/summer chinook salmon ESU as a whole. This ESU includes all natural-origin populations in the Tucannon, Grande Ronde, Imnaha, and Salmon Rivers. The Snake River spring/summer chinook ESU consists of 31 local spawning populations (subpopulations) spread over a large geographic area (Lichatowich et al. 1993). It is also important to consider the 15 spawning aggregations recently identified by Lohn (2002). The number of fish returning to Lower Granite Dam includes fish returning to each of these subpopulations and spawning aggregations in various proportions. The relationships between these subpopulations, and particularly the degree to which individuals may intermix, are unknown. Some or all of the fish returning to several of the hatchery programs are also listed including those returning to the Tucannon River, Imnaha, and Grande Ronde hatcheries, and to the Sawtooth, Pahsimeroi, and McCall hatcheries on the Salmon River.

The state and tribal proposals are all defined in terms of mortality rate limits, so the proposed numerical impacts would change with changing run sizes inseason and according to the abundance based harvest rate schedules in Tables 5 and 6. If the run size drops substantially, the incidental harvest rate limit would be lower and if the run size increases, the harvest rate limit could be somewhat increased.

This proposed cumulative incidental take is greater than the 287 provided by NMFS’ evaluation criteria defined in Tables 5 and 6. The combined incidental mortality rate of the proposed fisheries is 412 listed fish destined for the South Fork Salmon River, between the confluence of the East Fork South Fork and the South Fork Salmon River weir (185-Shoshone-Bannock Tribes, 133-Nez Perce Tribe, 94-ID).

The proposed South Fork Salmon River fisheries considered in this biological opinion will have little or no effect on most stocks within the basin. The proposed fisheries are terminal-area fisheries and will thus affect only the stocks returning to the South Fork Salmon River. The South Fork Salmon River fisheries as proposed would result in a harvest of 15,159 surplus unlisted fish when there is only 11,168 available. Also, the total incidental take associated with the South Fork Salmon River fisheries in Poverty Flats is 171 listed fish, which is 95 listed fish more than what is allowed by the harvest rate schedule for Poverty Flats (Table5). The total proposed incidental take in the South Fork Salmon River is 412 listed fish, which is at least 125 more listed fish than what the two abundance based harvest rate schedules combined would authorize in 2004 (Tables 5 and 6).

NMFS believes that the established harvest rate schedules used during this consultation are consistent with survival and recovery objectives of the listed fish and can be used to manage this South Fork Salmon River fishery into the future. The schedules are tied specifically to anticipated returns to each area in a particular year. The allowable harvests are conservative, allowing harvest rates that range from zero to 8% plus 35% of fish returning above the escapement goal for the Poverty Flats area, and zero to 12% plus 35% of the fish returning to the Stolle Meadows area, thus allowing for an assessment of productivity assumptions when escapements exceed interim abundance objectives.

The harvest rate schedule for Poverty Flats area is related to the status of the natural-origin fish. The harvest rate schedule for the Stolle Meadows area is fully integrated with the propagation program, and the harvest rate is adjusted depending on the expected return above the weir given the management protocol for the propagation program.

6.0 CONCLUSION

The two separate harvest rate schedules (Table 5 and Table 6) are the established criteria for consultation on the South Fork Salmon River fisheries for listed chinook. After reviewing the current status of the Snake River Spring/Summer Chinook Salmon ESU considered in this opinion, the environmental baseline for the action area, the effects of the proposed fisheries as set forth in the biological assessments, and the cumulative effects, it is NMFS' biological opinion that the fisheries proposed by the Nez Perce Tribe and Shoshone-Bannock Tribes, in combination with the State of Idaho's recreational fisheries, are likely to jeopardize the continued existence of Snake River spring/summer chinook salmon. This determination is based on impacts on two important subpopulations of spring/summer chinook salmon resulting from the combination of proposed fisheries in the South Fork Salmon River, which exceed the incidental take established by previously defined criteria (NMFS 2000a, 2001a, and 2002; NMFS 2003).

7.0 REASONABLE AND PRUDENT ALTERNATIVE

Regulations implementing section 7 of the ESA (50 CFR 402.02) define reasonable and prudent alternatives as alternative actions, identified during formal consultation, that: (1) can be implemented in a manner consistent with the intended purpose of the action; (2) can be implemented consistent with the scope of the action agency's legal authority and jurisdiction; (3) are economically and technologically feasible; and (4) would, NMFS believes, avoid the likelihood of jeopardizing the continued existence of listed species or resulting in the destruction or adverse modification of critical habitat.

The focus for NMFS' jeopardy determination is the fact that the proposed fisheries would result in impacts on two subpopulations considered important to the structure and status of the Snake River Spring/Summer Chinook Salmon ESU beyond levels currently considered allowable.

Therefore, the reasonable course to avoid jeopardizing the ESU while still providing for the objective of the proposed action is to adjust the fishery implementation such that the described impact guidelines are not exceeded.

The key elements of the reasonable and prudent alternative were outlined in the previous synthesis section. The Poverty Flats and Stolle Meadows summer chinook salmon stocks in the South Fork Salmon River will be managed separately using the harvest rate schedules presented in section 3.3.2. Table 5 and Table 6 define the allowable level of harvest mortality for fish returning to the Poverty Flats index area and the Stolle Meadows areas, respectively. These take limits are defined using preseason forecast information, but will be adjusted inseason based on updated information on run size.

Given the 2004 preseason run size information, the incidental take limit for listed fish returning to the Poverty Flats index area is 4% of the run or 16 fish. The total combined allowable incidental mortality rate on listed fish returning to the South Fork weir is 287 listed fish based on the forecast return of 1062 listed fish.

Because of the relative status of the stocks, there is less opportunity to fish on the Poverty Flats area. Based on the relative abundance of listed fish expected to return to or pass through the Poverty Flats area, the numerical limit on the harvest of listed fish in the area below the Poverty Flats Pack Bridge is 76 fish (including 16 listed fish destined for Poverty Flats), and the total allowed incidental take is 287 listed fish (including the 76 listed fish allowed while fishing in Poverty Flats). Once the take of 76 is reached in Poverty Flats, the area below the Poverty Flats Pack Bridge shall be closed. Once the total incidental take of 287 listed fish is reached, all fisheries in the South Fork Salmon River shall be closed.

In considering the question of jeopardy it is also necessary to consider the proposed fisheries in the broader context of the ESU as a whole. As described above, proposed fisheries will be limited to the geographic areas in the Snake River basin that are influenced by hatchery production. As a result, only a few of the spring/summer chinook salmon subpopulations will be subject to any harvest associated with the proposed action. The Poverty Flats area has been the focus of much of this opinion, but it is one of five stocks identified in the South Fork Salmon River which is, in turn, one basin of a much larger ESU. In the hatchery production areas where harvest will occur, harvest will be limited and represent a small portion of the listed fish returning to those particular areas. Management measures implemented through the Reasonable and Prudent Alternative to limit the take of fish destined for the Poverty Flats index area would reduce proposed harvest rates to just 16 Poverty Flats listed fish or 4% of the run. Additional tribal fishing opportunity would be available upstream of the Poverty Flats Bridge until a total of 287 listed fish are taken in the South Fork Salmon River as a whole. Taken from this broader perspective, the limited level of harvest proposed represents a reasonable accommodation for treaty Indian ceremonial and subsistence fisheries that will not substantially affect the species' prospects for survival and recovery. Based on these considerations, NMFS concludes that

fisheries that are managed consistent with provisions of the South Fork Salmon River framework are not likely to jeopardize the continued existence of Snake River spring/summer chinook salmon.

8.0 INCIDENTAL TAKE STATEMENT

Section 9 of the ESA and Federal regulations pursuant to section 4(d) of the ESA prohibit the take of endangered and threatened species, respectively, without special exemption. “Take” is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. “Harm” is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns, including breeding, feeding, or sheltering. “Harass” is defined as intentional or negligent actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering. “Incidental take” is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the ESA provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement (ITS).

The measures described below are non-discretionary; they must be undertaken by the action agency so that they become binding conditions of any grant or permit issued to the applicant, as appropriate, in order for the exemption in section 7(o)(2) to apply. The action agency has a continuing duty to regulate the activity covered in this incidental take statement. If the action agency (1) fails to assume and implement the terms and conditions or (2) fails to require the applicant to adhere to the terms and conditions of the incidental take statement through enforceable terms that are added to the permit or grant document, the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the agency must report the progress of the action and its impact on the species to NOAA Fisheries as specified in the incidental take statement [50 CFR §402.14(I)(3)].

An incidental take statement specifies the impact of any incidental taking of endangered or threatened species. It also provides reasonable and prudent measures that are necessary to minimize impacts and sets forth terms and conditions with which the action agency must comply in order to implement the reasonable and prudent measures.

8.1 Amount or Extent of Incidental Take Anticipated

No Snake River sockeye, fall chinook salmon or steelhead are expected to be taken as a result of the 2004 fisheries proposed for the Snake River Basin.

The amount of anticipated incidental take of Snake River spring/summer chinook salmon is expressed in terms of mortality rates, as a percentage of the total runsize, according to the

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proposed abundance-based schedule described in the plan and summarized in Tables 5 and 6. Allowable take is defined this way so as to be responsive to varying runsize.

This consultation specifically considers proposed Nez Perce Tribe and Shoshone-Bannock Tribes Tribal fisheries on the South Fork Salmon River. However, the state of Idaho has also proposed fisheries in the South Fork Salmon River which are authorized under section 10 permit 1233, subject to the requirement that the state fisheries be in compliance of total incidental take limits for the combined fisheries. This consultation therefore defines the take limit for the South Fork Salmon River fishery that is applied to the Tribal fisheries through this consultation and the state of Idaho through permit 1233.

The take limit for natural-origin fish destined to return to the Poverty Flats index area is 16 fish as defined by the harvest rate schedule in Table 5 of this Opinion, but may change in season in response to changes in expected returns. The take limit for listed fish returning to the South Fork weir based on preseason expectations is 194 listed fish as defined by the harvest rate schedule in Table 6 of this Opinion. Because there are other listed fish passing through the action areas, which are destined for neither Poverty Flats nor Stolle Meadows, the overall take of listed fish while fishing in the Poverty Flats area is 76 listed fish and the overall take allowed is 287 listed fish total. The overall harvest rate and associated take level is determined by the harvest rate schedule found in section 3.3.2 and may vary inseason based on updated estimates of run size.

As discussed above, fish returning to the Poverty Flats index area are relatively depressed and can sustain less harvest than those returning to Stolle Meadows. Fisheries in Poverty Flats can target fish passing through, but will also likely affect fish destined for Poverty Flats. This incidental take statement therefore limits take of listed fish in the area below the Poverty Flats Pack Bridge to 76 fish. This is based on a 16 fish incidental take limit for Poverty Flats fish and the expectation that 60 listed fish destined to other areas of the South Fork Salmon River will also be taken. Once 76 listed fish have been taken in the area below the Poverty Flats Pack Bridge, that area shall be closed to further fishing. Similarly, our calculation indicate that the parties may also take an additional 211 listed fish total, while pursuing a fishery above Poverty Flats Bridge that allows the incidental take of 151 Stolle Meadows fish and 60 listed fish destined for section 27 in the South Fork Salmon River (see Appendix 1).

8.2 Effect of the Take

In this Opinion, NMFS has determined that the level of take anticipated with the Reasonable and Prudent Alternative is not likely to jeopardize the continued existence of listed Snake River spring/summer chinook salmon.

8.3 Reasonable and Prudent Measures

- 1 The tribes and the states shall manage their fisheries to minimize harvest impacts to listed salmonids consistent with their proposals.

- 2 The tribes and the states shall conduct sufficient monitoring and enforcement activities to allow the accurate and timely enumeration of observed and estimated mortalities of listed hatchery-origin and natural-origin fish.

8.4 Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the ESA, the action agencies must comply with the following terms and conditions, which implement the reasonable and prudent measures described above and outline required reporting/monitoring requirements. These terms and conditions are non-discretionary.

- 1a. The Nez Perce Tribe and the Shoshone-Bannock Tribes must manage their fisheries to limit their harvest of spring/summer chinook salmon to the levels described in the biological assessment, as modified by this biological opinion. Inseason management actions taken during the course of the fisheries must be consistent with the harvest objectives described and summarized in this Opinion.
- 1b. The allowable impact to listed in the proposed South Fork Salmon River fishery is dependent upon the actual return to the Poverty Flats and Stolle Meadows areas. Initial projections of returns are made as described in the biological assessment. Expected returns to the Poverty Flats and Stolle Meadows index area can be refined as the season progresses. Therefore, the State of Idaho, the Nez Perce Tribe and the Shoshone-Bannock Tribes must continuously monitor returns to Lower Granite Dam and to the South Fork Salmon River weir by contacting facility managers and other fishery management personnel as needed. TAC shall update return projections inseason as information is available, and shall report this information to NMFS, the State of Idaho and the tribes as soon as the projections are updated. Inseason monitoring of catch must continue at levels sufficient to fully describe the composition of the catch, in terms of hatchery- vs. natural- origin, and listed vs. unlisted status, such that daily progress of the fishery toward guidelines and constraints can be determined and appropriate steps to modify or close fishery areas can be taken when necessary. This monitoring must take the form of fisheries personnel representing the appropriate fisheries co-manager(s) present at the time of any implemented fishery and conducting creel surveys, exit surveys, and personal observations of the course of the fishery, including enumerating number and types of fish caught by type of gear and by fishery area, numbers released by type of gear and fishery area, and other information on the fishery related to the successful moderation of impacts to listed species. Any other method of determining take (both retained and released

catch), must also be conducted as needed to provide fuller information on fishery impacts.

- 1c. Sampling of the fisheries for stock composition, including the collection of coded-wire tags and biological information, must also continue at levels comparable to those in recent years, and must be increased where necessary to insure a thorough post-season analysis of fishery impacts on listed species.
- 1d. The Nez Perce Tribe, the Shoshone-Bannock Tribes and the State of Idaho shall forward to NMFS a postseason report detailing and summarizing the actual catch in the South Fork Salmon River fishery. An analysis of impacts on listed natural-origin and hatchery-origin fish shall be a part of this report. Information on stock composition obtained through coded-wire tag recoveries, genetic stock sampling, or sampling for other biological information should also be included. This report shall be provided to Enrique Patiño, NMFS, Sustainable Fisheries Division, Seattle, Washington, by April 15, 2005.
- 2a. Inseason monitoring of catch and other management measures must continue at levels sufficient to fully describe the composition of the catch, in terms of species, hatchery- vs. natural- origin, and listed vs. unlisted status (primarily reliant upon existence and type of mark), such that daily progress of the fishery toward guidelines and constraints can be determined and appropriate steps to modify or close each given fishery can be taken when necessary. Timely inseason monitoring is critical. This monitoring must take the form of fisheries personnel representing the appropriate fisheries co-manager(s) present at the time of the fishery and conducting creel surveys, exit surveys, and personal observations of the course of the fishery, including enumerating number and types of fish caught, numbers released, and other information on the fishery related to the successful moderation of impacts to listed species. Any other method of determining take (both retained and released catch), such as telephone surveys, must also be conducted as needed to provide fuller information on fishery impacts.
- 2b. Catch reports from the inseason monitoring programs for each management entity shall be provided to NMFS weekly or more often if necessary to allow for implementation of management actions consistent with terms and conditions of this opinion.

- 2c. The Nez Perce Tribe and the Shoshone-Bannock Tribes shall curtail their South Fork Salmon River fishery when the guidelines for hatchery-origin and natural-origin adult harvest based on projected returns have been reached.
- 2d. Each entity opening a fishery shall take measures to reduce the deliberate illegal take of listed fish. These measures shall include extensive presence of law enforcement personnel representing the appropriate co-manager(s) at the fishing area, including areas which are not open to fishing but may experience illegal effort. Enforcement personnel and conservation officers of each entity shall report the incidental take of adult and juvenile listed salmon in the fisheries. Co-managers' personnel shall conduct creel surveys or other forms of angler contact to monitor the possible incidence of illegal harvest activity. Enforcement personnel and conservation officers of each entity shall coordinate with the other co-managers to best assure adequate coverage of fishery areas, and shall share, on a timely basis, information on potential enforcement issues obtained during enforcement, monitoring, redds counts, stream surveys, or other activities. The illegal take of listed fish should be described in the required report developed post-season by each party, as described in Term and Condition 1a above.
- 2e. Each entity opening a fishery shall take measures to prevent the inadvertent illegal take of listed fish. Each co-manager shall take measures to inform fishers on subjects such as differentiating listed from non-listed fish, avoiding redds, and methods for releasing non-target fish. Actions should also be taken to identify and protect, through warning signs or other means, critical spawning areas of listed salmon.

The NMFS believes that incidental take resulting from the proposed South Fork Salmon River fishery as outlined here would be no greater than described in section 8.1, above. The reasonable and prudent measures, with their implementing terms and conditions, are designed to minimize the impact of incidental take that might otherwise result from the proposed action. If, during the course of the action, the specified level of incidental take is exceeded, such incidental take represents new information requiring reinitiation of consultation and review of the reasonable and prudent measures provided. The agencies must immediately provide an explanation of the causes of the excess taking, and review with the NMFS the need for possible modification of the reasonable and prudent measures.

9.0 CONSERVATION RECOMMENDATIONS

Conservation recommendations are discretionary measures suggested to minimize or avoid adverse effects of a proposed action on ESA-listed species or critical habitat, to develop additional information, or to assist Federal agencies in complying with their obligations under section 7(a)(1) of the ESA. NMFS does not have any conservation recommendations associated with this action at this time.

10.0 REINITIATION OF CONSULTATION

This concludes formal consultation on the proposed South Fork Salmon River fishery in the Snake River Basin. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary federal agency involvement or control over the action has been retained (or is authorized by law) and if: (1) the amount or extent of incidental take is exceeded; (2) new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered; (3) the identified action is subsequently modified in a manner that causes an effect to listed species or critical habitat that was not considered in the biological opinion; (4) a new species is listed or critical habitat designated that may be affected by the identified action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

NMFS finds the management constraints contained in this opinion necessary for the conservation of the affected listed species. In arriving at these management constraints, NMFS has been mindful of affected treaty rights and its Federal trust obligations. NMFS will reconsider the management constraints in this opinion that affect treaty rights in the event new information indicates such reconsideration is warranted.

11.0 MAGNUSON-STEVENSON ACT ESSENTIAL FISH HABITAT CONSULTATION

The Magnuson-Stevens Fishery Conservation and Management Act (ESA), as amended by the Sustainable Fisheries Act of 1996 (Public Law 104-267), established procedures designed to identify, conserve, and enhance Essential Fish Habitat (EFH) for those species regulated under a Federal fisheries management plan. Pursuant to the ESA:

- Federal agencies must consult with NOAA Fisheries on all actions, or proposed actions, authorized, funded, or undertaken by the agency, that may adversely affect EFH (§305(b)(2));
- NOAA Fisheries must provide conservation recommendations for any Federal or State action that would adversely affect EFH (§305(b)(4)(A));
- Federal agencies must provide a detailed response in writing to NOAA Fisheries within 30 days after receiving EFH conservation recommendations. The response must include a description of measures proposed by the agency for avoiding, mitigating, or offsetting

the impact of the activity on EFH. In the case of a response that is inconsistent with NOAA Fisheries EFH conservation recommendations, the Federal agency must explain its reasons for not following the recommendations (§305(b)(4)(B)).

EFH means those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity (ESA §3). For the purpose of interpreting this definition of EFH: Waters include aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; substrate includes sediment, hard bottom, structures underlying the waters, and associated biological communities; necessary means the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and "spawning, breeding, feeding, or growth to maturity" covers a species' full life cycle (50 CFR 600.10). Adverse effect means any impact which reduces quality and/or quantity of EFH, and may include direct (*e.g.*, contamination or physical disruption), indirect (*e.g.*, loss of prey or reduction in species fecundity), site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions (50 CFR 600.810).

EFH consultation with NOAA Fisheries is required regarding any Federal agency action that may adversely affect EFH, including actions that occur outside EFH, such as certain upstream and up slope activities.

The objectives of this EFH consultation are to determine whether the proposed action would adversely affect designated EFH and to recommend conservation measures to avoid, minimize, or otherwise offset potential adverse effects to EFH.

11.1 Identification of Essential Fish Habitat

Pursuant to the ESA, the Pacific Fisheries Management Council (PFMC) has designated EFH for three species of federally-managed Pacific salmon: chinook (*Oncorhynchus tshawytscha*); coho (*O. kisutch*); and Puget Sound pink salmon (*O. gorbuscha*) (PFMC 1999). Freshwater EFH for Pacific salmon includes all those streams, lakes, ponds, wetlands, and other water bodies currently, or historically accessible to salmon in Washington, Oregon, Idaho, and California, except areas upstream of certain impassable man-made barriers (as identified by the PFMC 1999), and longstanding, naturally-impassable barriers (*i.e.*, natural waterfalls in existence for several hundred years). Detailed descriptions and identifications of EFH for salmon are found in Appendix A to Amendment 14 to the Pacific Coast Salmon Plan (PFMC 1999). Assessment of potential adverse effects to these species' EFH from the proposed action is based, in part, on this information.

11.2 Proposed Action and Action Area

For this EFH consultation, the proposed actions and action area are as described in detail above (section 1.0 of the Opinion). The action is the issuance of an incidental take statement pursuant

to section 7 of the ESA. The proposed action area is the mainstem of the South Fork Salmon River in Idaho, and is part of EFH designated for various life stages of chinook salmon.

11.3 Effects of the Proposed Action

Based on information submitted by the BIA, as well as NOAA Fisheries' analysis in the ESA consultation above, NOAA Fisheries believes that the effects of this action on Snake River spring/summer chinook habitat are likely to be within the range of effects considered in the ESA portion of this consultation. Effects of the proposed action would be limited to interference with migratory passage of a very small proportion of the Snake River spring/summer chinook salmon return due to fishery timing and run timing.

11.4 Conclusion

Using the best scientific information available and based on its ESA consultation above, as well as the foregoing EFH sections, NOAA Fisheries has determined that the proposed action is not likely to adversely affect EFH for chinook salmon.

11.5 EFH Conservation Recommendation

Because this action has been determined not likely to adversely affect EFH for Pacific salmon, no conservation recommendations have been developed, and no statutory response is required.

11.6 EFH Consultation Renewal

The action agencies must reinitiate EFH consultation if plans for these actions are substantially revised in a way that may adversely affect EFH, or if new information becomes available that affects the basis for the EFH conservation recommendations (50 CFR § 600.920(k)).

12.0 SECTION 515 PRE-DISSEMINATION REVIEW & DOCUMENTATION

The Data Quality Act specifies three components contributing to the quality of a document. These are utility, integrity, and objectivity. This section documents compliance with Section 515 of the Treasury and General Government Appropriations Act of 2001 (Public Law 106-554, the 'Data Quality Act'), and certifies that this document has undergone pre-dissemination review.

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Medium of distribution: Individual copies were provided electronically and in hard copy to the Bureau of Indian Affairs (BIA), the Shoshone-Bannock Tribes, and the Nez Perce Tribe. May be posted on the NMFS NW Region web site.

Medium of distribution: Individual copies of the biological opinion were provided electronically and in hard copy to the BIA, the Shoshone-Bannock Tribes, and the Nez Perce Tribe. The biological opinion may be posted on the NMFS NW Region web site.

Utility of Biological Opinion

Consultation by Federal agencies with NMFS is required under section 7 of the ESA whenever a Federal agency approves, funds or carries out an action that might affect a listed species. This consultation was required under the ESA to determine whether the South Fork Salmon River fishery would appreciably reduce the survival and recovery, i.e., jeopardize the continued existence, of the affected Snake River Spring/Summer Chinook salmon ESU before the BIA could proceed with administration of Tribal fishery management programs. Supplying copies of the document to the management agencies provides them with the documentation that NMFS has determined that the proposed fisheries, as modified by the Reasonable and Prudent Alternative will not jeopardize the continued existence of the affected ESU. Providing copies to the tribes is consistent with their roles as fishery managers for the affected ESUs and with NMFS' obligations under Secretarial Order 3206 (Department of Interior Order 3206, American Indian Tribal Rights, Federal-Tribal Trust Responsibilities and the Endangered Species Act).

Integrity of Biological Opinion

The documents in this regulatory package are managed by NMFS on a computer network in accordance with relevant IT security policies and regulations such as the standards set out in Appendix III, "Security of Automated Information Resources", OMB Circular A-130; the Computer Security Act; and the Government Information Security Reform Act.

Objectivity of Biological Opinion

Information Product Category: Natural Resource Plan

Standards. This consultation and supporting documents adhere to published standards including:

1. ESA Consultation Handbook
2. ESA Regulations, 50 CFR 402.01 et seq.
3. Magnuson-Stevens Act implementing regulations regarding EFH, 50 CFR 600.920(j)

Best Available Information. This consultation and supporting documents use the best available information. More information on the information used is contained in the biological opinion and the analytical documents referenced in the ESA section 7 and EFH consultations.

Transparency. Policy choices are clearly distinguished from the supporting science. Supporting materials, information, data, and analyses are referenced to ensure transparency.

Referencing: All supporting materials, information, data and analyses are properly referenced, consistent with standard scientific referencing style.

Review Process. This document has been drafted and reviewed by staff with training in ESA and Magnuson-Stevens Act implementation. Legal review has been performed for consistency with applicable law, including the ESA.

Appendix 1. Projected preseason Lower Granite Dam counts and Snake River tributary Adult returns of spring and summer chinook in 2004.

Forecasts Spring/Summer Chinook										
Lower Granite Dam Total		161,204								
Lower Granite Dam Hatchery (ad-clipped)		115,759								
Lower Granite Dam Hatchery (not ad-clipped)		4,472								
Lower Granite Dam Wild		40,973								
		Broodstock Required	Marked Unlisted Hatchery	Unmarked Unlisted Hatchery	Ad-clipped Listed Hatchery	Non Ad Clipped Listed				
						Hatchery	Wild/Natural	Total Listed	Total	Footnotes
Tributary										
Snake River										
	Oxbow Hatchery		5,936	--	0		0	0	5,936	1/
Tucannon River		100	--	--	512		299	811	811	2/
Clearwater River										
	Clearwater Wild/Natural		--				10,292	0	10,292	3/
	Clearwater Hatchery	2,100	28,066						28,066	
	Walton Creek (Powell)		10,403						10,403	
	Red River		4,157						4,157	
	Crooked River		8,621						8,621	
	N.F. Clearwater River		2,450						2,450	
	S.Fk Clearwater R. (Red House Hole)		1,468					0	1,468	5/
	Dworshak Hatchery	1,800	12,297				0	0	12,297	6/
	Kooskia Hatchery		6,758				0	0	6,758	7/
Subtotal Clearwater			47,121	0	0		10,292	0	57,414	
Salmon River										
	Little Salmon and Rapid River		0				770	770	770	8/
	Rapid River Hatchery	2,400	32,809				0	0	32,809	9/
	Lower Main Salmon		0				443	443	443	10/
	Middle Main Salmon		0				918	918	918	11/
*	Secesh, Johnson, EFSFSR						2,745	2,745	2,745	12/

*	South Fork Salmon Mouth to Miners		0				40	40	40	13/
*	South Fork Salmon Miners to Poverty		0				394	394	394	13/
*	South Fork Salmon Poverty to Weir		0				419	419	419	13/
*	South Fork Salmon River Weir		12,568		0	397	681	1,078	13,646	14/
	Middle Fork Salmon		0				7,658	7,658	7,658	15/
	Panther Creek		0				0	0	0	16/
	Upper Main Salmon (Mid. To Lemhi)						0	0	0	19/
	Lemhi River		0				1,201	1,201	1,201	17/
*	Pahsimeroi Hatchery	193	473	0	2,297	743	336	3,376	3,849	18/
	East Fork Salmon River						1,299	1,299	1,299	20/
	East Fork Rack		0				0	0	0	21/
	Yankee Fork						766	766	766	22/
	Valley Creek						639	639	639	23/
	Main Salmon Lemhi to Sawtooth						2,360	2,360	2,360	24/
	Sawtooth Hatchery Weir	700	0		1,505	290	400	2,195	2,195	25/
	Subtotal Salmon River above Lemhi River (includes everything)	893	473	0	3,802	1,033	5,800	10,635	11,108	
	Grande Ronde River									
	Grande Ronde Subbasin		–		1,932	0	572	2,504	2,504	26/
	Lookingglass Hatchery	120	193				152	152	345	27/
	Imnaha River									
	Imnaha Subbasin	230	–		4,355	0	1,740	6,095	6,095	28/
	TOTAL		99,100	0	10,601	1,430	34,124	35,862	145,255	
	* Summer Chinook									
			Total Hatchery		109,701					

Footnotes For Appendix 1

- 1/ Oxbow Hatchery. Independent prediction by IDFG. In 2002 the number of wild/natural adults forecasted to return was based on a proportion of the number of hatchery origin adults (about 1%) In 2003 no hatchery origin adults are forecasted to return and therefore no wild/natural adults are forecasted to return.
- 2/ Tucannon River. Independent prediction by WDFW. These fish are Listed.
- 3/ Clearwater Wild/Natural proportion spring/summer smolt production above Lower Granite Dam (.2521). Values from Subbasin Planning Smolt Density Model, (Petrosky & Kiefer, 7/2/91), StreamNet.
- 4/ Red River Rack and Crooked River Rack. Independent prediction by IDFG. Does not include a forecast for number of RV and LV clipped chinook that were released as parr.
- 5/ Powell Rack. Independent prediction by IDFG. Does not include a forecast for the number of fish that were not fin clipped but were CWT.
- 6/ Dworshak Hatchery. Independent prediction by USFWS. Does not include a forecast for the number of fish that were not fin clipped but were CWT.
- 7/ Kooskia Hatchery. Independent prediction by USFWS. Does not include a forecast for number of RV and LV clipped chinook.
- 8/ Little Salmon and Rapid River Wild/Natural proportion spring/summer smolt production above Lower Granite Dam (.0188). Values from Subbasin Planning Smolt Density Model (Petrosky & Kiefer, 7/2/91), StreamNet.
- 9/ Rapid River Hatchery. Independent prediction by IDFG.
- 10/ Lower Main Salmon Wild/Natural proportion spring/summer smolt production above Lower Granite Dam (.0108). Values from Subbasin Planning Smolt Density Model, (Petrosky & Kiefer, 7/2/91), StreamNet.
- 11/ Middle Main Salmon Wild/Natural proportion spring/summer smolt production above Lower Granite Dam (.0224). Values from Subbasin Planning Smolt Density Model, (Petrosky & Kiefer, 7/2/91), StreamNet.
- 12/ Secesh R. and Johnson Cr. Wild/Natural. Proportion spring/summer smolt production above Lower Granite Dam (.0670). Values from Subbasin Planning Smolt Density Model, (Petrosky & Kiefer, 7/2/91), StreamNet.
- 13/ South Fork Salmon River sections 27-29 - below weir. Average of sibling/redd estimate (IDFG) and redd/LGR estimate (SBT).
- 14/ South Fork Salmon River Rack. Independent prediction by IDFG. Does not include a forecast for number of chinook that were CWT only and released as parr. Supplementation fish above weir are listed.
- 15/ Middle Fork Salmon Wild/Natural proportion spring/summer smolt production above Lower Granite Dam (.1869). Values from Subbasin Planning Smolt Density Model (Petrosky & Kiefer, 7/2/91), StreamNet.
- 16/ Panther Creek Wild/Natural. IDFG and SBT consider this run extirpated.
- 17/ Lemhi River Wild/Natural proportion spring/summer smolt production above Lower Granite Dam (.0293). Values from Subbasin Planning Smolt Density Model (Petrosky & Kiefer, 7/2/91), StreamNet.
- 18/ Pahsimeroi Hatchery. Independent prediction by IDFG.

These fish are listed.

- 19/ Upper Main Salmon (Middle Fork to Lemhi) Wild/Natural proportion spring/summer smolt production above Lower Granite Dam (0.0). Values from Subbasin Planning Smolt Density Model (Petrosky & Kiefer, 7/2/91), StreamNet.
- 20/ East Fork Salmon Wild/Natural spring/summer smolt production above Lower Granite Dam (.0317). Values from Subbasin Planning Smolt Density Model (Petrosky & Kiefer, 7/2/91), StreamNet.
- 21/ East Fork Rack. Independent prediction by IDFG.
- 22/ Yankee Fork Salmon Wild/Natural spring/summer smolt production above Lower Granite Dam (.0187). Values from Subbasin Planning Smolt Density Model (Petrosky & Kiefer, 7/2/91), StreamNet.
- 23/ Valley Creek Salmon Wild/Natural spring/summer smolt production above Lower Granite Dam (.0156). Values from Subbasin Planning Smolt Density Model (Petrosky & Kiefer, 7/2/91), StreamNet.
- 24/ Main Salmon River from above the Lemhi to Sawtooth Hatchery Wild/Natural proportion spring/summer smolt production above Lower Granite Dam (.0576). Values from Subbasin Planning Smolt Density Model (Petrosky and Kiefer, 7/2/91), StreamNet.
- 25/ Sawtooth Hatchery. Independent prediction by IDFG. These fish are listed.
- 26/ Grande Ronde Subbasin. Independent prediction by ODFW. Does not include Lookingglass Creek returns. These fish are listed.
- 27/ Lookingglass Hatchery. Independent prediction by ODFW.
- 28/ Imnaha Subbasin. Independent prediction by ODFW. These fish are listed.

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Appendix 2. Calculation of impacts and allowable take based on fishery proposals and preseason forecasts.

			Allowed HR for PF	Take of listed PF fish allowed while fishing in sections 28-29	Total allowable take of listed fish in sections 28-29	Take of listed fish allowed while fishing in sections 28-29	Number of Section 26 fish allowed Total	Remaining Number of Section 26 fish allowed	Total take of listed fish allowed while fishing in section 27	Take of listed fish allowed while fishing in section 27
Harvest	Forecast	section		16	76	42	194	152	210	152
194	1,062	section 26				17				59
75	413	section 27				16				
16	388	section 28	4%			2				
2	39	section 29				76			210	
	1,902									
	12,568	Unlisted Hatchery								
After Lower River harvest	Section 26 Forecast									
671	681	Listed Natural-Origin								
391	397	Listed Supplementation								
1062	1078	Listed Fish Above Weir								
Proposed harvest and Resulting Impacts										
	Poverty Flats	Stolle Meadows	surplus							
IDFG Lower Salmon	NA	NA	1,675							
IDFG South Fork		94	3,909							
SBT	38	147	3,991							
NPT	133		5,584							
412	171	241	15,159							
287	76	210	11,168							
125	95	31	3,991	available deficit						
Lower River Harvest										
Stolle Meadows - Wild	10	Lower Salmon River								
Stolle Meadows - Hatchery	6	Lower Salmon River impacts								
section 27	6	Lower Salmon River impacts								
section 29	1	Lower Salmon River impacts								